

**To:** Snyder, Erik[snyder.erik@epa.gov]  
**Cc:** Dominic Ruggeri[dom.ruggeri@tceq.texas.gov]; Ron Thomas[Ron.Thomas@tceq.texas.gov]  
**From:** Daniel Menendez  
**Sent:** Mon 8/24/2015 12:51:26 PM  
**Subject:** RE: Potential R6 Modeling workshop in Dallas in early November

Hello Erik,

We are glad to hear you are considering a Region 6 modelers meeting. It is something we are interested in and will begin the process to get travel approval once the dates have been confirmed.

That being said, we hope you can consider earlier dates for the meeting. With the short time frame requirements of the DRR, an earlier meeting would be beneficial so that we can incorporate any discussions during the meeting into our plan to evaluate the DRR sources. A meeting in November would not allow much time before the January deadline to identify the sources/areas to be evaluated.

Thanks,

Daniel

**From:** Snyder, Erik [mailto:snyder.erik@epa.gov]  
**Sent:** Wednesday, August 19, 2015 11:16 AM  
**To:** Daniel Menendez; Daniel Jamieson; Dominic Ruggeri; Ron Thomas; Zarena Post; Jeff Stonesifer; Sufi Mustafa; Eric Peters; Gi-Dong; Eric Milligan; Lee Warden; Thomas Rheaume; vennetta.hayes@la.gov; Tien Nguyen; Yvette Olmos; Jim Smith  
**Cc:** Mohr, Ashley; Feldman, Michael; Robinson, Jeffrey; Donaldson, Guy  
**Subject:** Potential R6 Modeling workshop in Dallas in early November

Hi,

We haven't had a Region 6 modelers workshop in Dallas in a while. With the final DRR and

proposed changes in App. W, thought it might be a good time to have a meeting here in Dallas. I am not planning on discussing photochemical issues other than maybe secondary pollutant analysis for permits. The main focus would be modeling for the SO<sub>2</sub> sources as part of the SO<sub>2</sub> Phase 3 and 4 designations process (either modeling directly or modeling for monitor locations around a facility). We could also discuss other issues if there is interest. I was thinking some discussion on ozone and PM<sub>2.5</sub> impacts from single source for permitting might and what sources should be included in cumulative analysis are two topics that might also be beneficial. At this time I am targeting the first week in November (11/2-11/5) as possible date(s). Would only plan for 1 or two days within this period but we have locked meeting space for M-R currently. I think we will be able to get one or two people from OAQPS that week to come to Dallas (James Thurman and/or George Bridgers most likely). They are available for travel and this would be after the close of the proposed changes to App. W, so we could talk about any of the proposed changes.

Please let me know your interest and availability (if this week works and if M-T, T-W or W-R is best). Also any ideas for specific topics/issues.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Clark, David[CLARKD@adeq.state.ar.us]  
**From:** Snyder, Erik  
**Sent:** Fri 5/5/2017 3:57:50 PM  
**Subject:** RE: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Thursday 2-3 works I think.

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Clark, David [mailto:CLARKD@adeq.state.ar.us]  
**Sent:** Friday, May 05, 2017 10:51 AM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Subject:** RE: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Erik,

Tuesday afternoon no longer works for us. Does Thursday afternoon work for you guys? I'll have to check on Thursday afternoon with the consultants, but I won't hear back until Monday morning.

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

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**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]  
**Sent:** Friday, May 05, 2017 10:36 AM  
**To:** Clark, David; Mohr, Ashley  
**Cc:** McCorkle, Mark; Montgomery, William  
**Subject:** RE: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Does 2-3 on Tuesday work?

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]  
**Sent:** Friday, May 05, 2017 10:08 AM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>; Mohr, Ashley <[Mohr.Ashley@epa.gov](mailto:Mohr.Ashley@epa.gov)>  
**Cc:** McCorkle, Mark <[MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us)>; Montgomery, William <[Montgomery@adeq.state.ar.us](mailto:Montgomery@adeq.state.ar.us)>  
**Subject:** RE: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Thank you Erik.

**David W. Clark, M.S.**

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**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]

**Sent:** Friday, May 05, 2017 10:07 AM

**To:** Clark, David; Mohr, Ashley

**Cc:** McCorkle, Mark; Montgomery, William

**Subject:** RE: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Hi David,

We did get the email and forward. I have not heard back from OAQPS on time for a call next week. I will follow-up with them and let you know.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]  
**Sent:** Friday, May 05, 2017 10:03 AM  
**To:** Mohr, Ashley <[Mohr.Ashley@epa.gov](mailto:Mohr.Ashley@epa.gov)>; Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Cc:** McCorkle, Mark <[MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us)>; Montgomery, William <[Montgomery@adeq.state.ar.us](mailto:Montgomery@adeq.state.ar.us)>  
**Subject:** FW: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Erik & Ashley,

Can you please confirm for me that the below email made it to you?

David

**David W. Clark, M.S.**

Epidemiologist

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Arkansas Department of Environmental Quality

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reply e-mail and destroy all copies of the original message.

**From:** Clark, David  
**Sent:** Thursday, April 27, 2017 7:52 AM  
**To:** 'Mohr, Ashley'; Snyder, Erik  
**Cc:** Montgomery, William; McCorkle, Mark; Shelton, Travis  
**Subject:** RE: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Erik & Ashley,

Attached is a protocol for a WRF Model Performance Evaluation for our Independence County SO<sub>2</sub> work. Could you please pass this along to others who were on our April 6 call -- James Thurman, Chris Misenis and George Bridgers, I believe.

Can we also schedule a follow-up call for feedback sometime during the week of May 8-12? We are available Monday morning, Tuesday afternoon, and Thursday afternoon.

David

**David W. Clark, M.S.**

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recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message.

**From:** Mohr, Ashley [<mailto:Mohr.Ashley@epa.gov>]  
**Sent:** Thursday, April 06, 2017 10:54 AM  
**To:** Clark, David  
**Cc:** Snyder, Erik  
**Subject:** RE: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Thanks David. I will pass along to others and talk with you all later today.

Thanks,

Ashley

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OFFICIAL EPA POLICY.

**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]  
**Sent:** Thursday, April 06, 2017 10:53 AM  
**To:** Mohr, Ashley <[Mohr.Ashley@epa.gov](mailto:Mohr.Ashley@epa.gov)>  
**Cc:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Subject:** RE: Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

Ashley & Erik,

Here is the Batesville Met data. The issue is the percent of “calms”. Distribute to EPA’s call attendees please.

David

**David W. Clark, M.S.**

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**From:** Mohr, Ashley [<mailto:Mohr.Ashley@epa.gov>]

**Sent:** Monday, April 03, 2017 4:02 PM

**To:** Clark, David

**Cc:** Snyder, Erik

**Subject:** Call In Details - Prognostic Met Data (Thursday, April 6th @ 1:00 PM)

David,

Here is the call in number information:

Number: 866-299-3188

Passcode: 214-665-7305#

Just let us know what you find out regarding the data fill amount and frequency information that I mentioned on the phone.

If you have any other questions let me know. Otherwise, talk to you all on Thursday!

Ashley

---

Ashley N.Q. Mohr  
Environmental Scientist  
Air Permits Section (6MM-AP)  
U.S. Environmental Protection Agency  
1445 Ross Avenue  
Dallas, TX 75202  
(214) 665-7289  
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**To:** Heath, David, NMENV[david.heath@state.nm.us]; Mustafa, Sufi A., NMENV[sufi.mustafa@state.nm.us]  
**From:** Snyder, Erik  
**Sent:** Tue 1/31/2017 1:00:03 PM  
**Subject:** RE: SJGS modeling files

Hi David,

Sorry I didn't get back with you yesterday. Yes we did get the files. Thanks again for getting them to me so quickly.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Heath, David, NMENV [mailto:david.heath@state.nm.us]  
**Sent:** Monday, January 30, 2017 11:34 AM  
**To:** Snyder, Erik <snyder.erik@epa.gov>; Mustafa, Sufi A., NMENV <sufi.mustafa@state.nm.us>  
**Subject:** RE: SJGS modeling files

Erik,

Just checking if you did receive the modeling files for the SGJS SO2 attainment project.

David Heath

Modeling Scientist

NMED / AQB

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]  
**Sent:** Friday, January 27, 2017 12:22 PM  
**To:** Mustafa, Sufi A., NMENV <[sufi.mustafa@state.nm.us](mailto:sufi.mustafa@state.nm.us)>  
**Cc:** Heath, David, NMENV <[david.heath@state.nm.us](mailto:david.heath@state.nm.us)>  
**Subject:** RE: SJGS modeling files

Thanks Sufi and David. Sorry we are on a short timeline on our end right now.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Mustafa, Sufi A., NMENV [<mailto:sufi.mustafa@state.nm.us>]  
**Sent:** Friday, January 27, 2017 1:18 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Cc:** Heath, David, NMENV <[david.heath@state.nm.us](mailto:david.heath@state.nm.us)>  
**Subject:** RE: SJGS modeling files

Erik

I am requesting Dave to send you files. If we have difficulty posting files we will let you know.

Sufi A. Mustafa, Ph.D.

Manager Air Dispersion Modeling and Emission Inventory Section

New Mexico Environment Department's Air Quality Bureau

Phone: 505 476 4318

525 Camino de los Marquez

Suite 1

Santa Fe, New Mexico, 87505

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]

**Sent:** Friday, January 27, 2017 10:02 AM

**To:** Mustafa, Sufi A., NMENV <[sufi.mustafa@state.nm.us](mailto:sufi.mustafa@state.nm.us)>

**Subject:** SJGS modeling files

Hi Sufi,

Hope things are going okay. Called and left a voicemail on your work #. I was wanting to get a copy of your modeling files for SJGS. Let me know if you have a way for ftp or if I should set up a temporary google docs site or something.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Clark, David[CLARKD@adeq.state.ar.us]  
**Cc:** Donaldson, Guy[Donaldson.Guy@epa.gov]; Medina, Dayana[Medina.Dayana@epa.gov]; Grady, James[Grady.James@epa.gov]; SPENCER@adeq.state.ar.us[SPENCER@adeq.state.ar.us]  
**From:** Snyder, Erik  
**Sent:** Tue 1/17/2017 3:58:24 PM  
**Subject:** RE: Plum Point & Flint Creek SO2 Reports

Hi David,

Wanted to confirm that we have the Plum Point and Flint Creek reports. Zipping them and then changing the extension worked. We also have 6 files for the Independence report that we will stitch back together on our end. We will also need to get the modeling files but will have to work something out other than email. Let me know if you all plan to set up ftp or send disks/dvds.

Thanks,

Erik

Erik Snyder

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EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Clark, David [mailto:CLARKD@adeq.state.ar.us]  
**Sent:** Tuesday, January 17, 2017 9:47 AM  
**To:** Snyder, Erik <snyder.erik@epa.gov>  
**Subject:** Plum Point & Flint Creek SO2 Reports

Erik,

Here are these two reports in the form of zipped files with the extensions renamed. Please confirm to Guy, Stuart Spencer and myself that you successfully received them.

David

**David W. Clark, M.S.**

Epidemiologist

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**To:** Clark, David[CLARKD@adeq.state.ar.us]  
**From:** Snyder, Erik  
**Sent:** Thur 1/12/2017 8:55:25 PM  
**Subject:** FW: ADEQ SO2 NAAQS Round 2 Follow-up Data Extension Request  
SO2 NAAQS Independence County Extension Letter\_Round2.pdf

Hi David,

Random Question, Can you check if there are any sources being modeled as area SO2 sources? OAQPS found a bug in the December AERMOD version that only impacts area sources. Doubt there are any significant area sources, but just thought I would check. Not sure where the project is at this point but if there are area sources OAQPS does have a corrected code I could get for you but the bug is only on area sources which are rare for SO2.

-Erik

Erik Snyder

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EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Donaldson, Guy  
**Sent:** Wednesday, January 11, 2017 3:56 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>; Imhoff, Robert <[imhoff.robert@epa.gov](mailto:imhoff.robert@epa.gov)>; Medina, Dayana <[Medina.Dayana@epa.gov](mailto:Medina.Dayana@epa.gov)>; Grady, James <[Grady.James@epa.gov](mailto:Grady.James@epa.gov)>  
**Subject:** FW: ADEQ SO2 NAAQS Round 2 Follow-up Data Extension Request

FYI,

Independence County modeling will be late.

Hopefully no more than a few weeks. Apparently had trouble getting contract rolling.

**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]  
**Sent:** Wednesday, January 11, 2017 2:27 PM  
**To:** Donaldson, Guy <[Donaldson.Guy@epa.gov](mailto:Donaldson.Guy@epa.gov)>  
**Cc:** Spencer, Stuart <[SPENCER@adeq.state.ar.us](mailto:SPENCER@adeq.state.ar.us)>  
**Subject:** ADEQ SO2 NAAQS Round 2 Follow-up Data Extension Request

Guy,

Please see the attached letter regarding our need for additional time to provide the follow-up data EPA requested for our Round 2 Independence County SO<sub>2</sub> NAAQS designation.

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
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**To:** Hurt, Charles[HURT@adeq.state.ar.us]; Clark, David[CLARKD@adeq.state.ar.us]  
**Cc:** Mohr, Ashley[Mohr.Ashley@epa.gov]; Imhoff, Robert[imhoff.robert@epa.gov]; Feldman, Michael[Feldman.Michael@epa.gov]  
**From:** Snyder, Erik  
**Sent:** Thur 10/20/2016 1:25:22 PM  
**Subject:** RE: AERMOD v16216 Questions

Hi Charles and David,

Would like to help you but the new version and MCB have not been released. Since the Draft Final FR package (Response to Comments, other documents, etc.) for the App. W changes includes references to the AERMOD version being released with App. W final package they locked in a date version since they don't know the exact date when the FR will be signed and the updated AERMOD released but they have to include the version in the materials. We have not seen the MCB or AERMOD version at the Regions and doubt we will see anything before the official release of the model on SCRAM.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Hurt, Charles [mailto:HURT@adeq.state.ar.us]  
**Sent:** Thursday, October 20, 2016 8:18 AM  
**To:** Snyder, Erik <snyder.erik@epa.gov>  
**Subject:** AERMOD v16216 Questions

Erik,

David Clark and I furthered our discussion on SO2 modeling. This agenda for the R/S/L workshop shows one of the presentations will touch on AERMOD v16216. The version would mean a date of Aug. 3. I have not seen any announcement on SCRAM stating that version is available.

Is there any chance you can let me get my hands on a copy of the model change bulletin and/or v16216?

Charles Hurt, P.E.

Engineer, Air Division

Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR 72118

PHONE: (501) 682-0804

FAX: (501) 682-0753

EMAIL: [hurt@adeq.state.ar.us](mailto:hurt@adeq.state.ar.us)

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]

**Sent:** Thursday, September 01, 2016 3:12 PM

**To:** Hurt, Charles

**Cc:** Imhoff, Robert

**Subject:** RE: SO2 Area Designation Including Background Concentrations in AERMOD Input files

Hi Charles,

Bob helped confirm my memory on this issue and pulled this summary together. Hope this summary on the topic helps.

In AQS an hour is defined as hour beginning and the time zone is local standard time.

From [https://aqs.epa.gov/aqsweb/documents/AQS\\_Format.html](https://aqs.epa.gov/aqsweb/documents/AQS_Format.html)

“

12Start Time	The time of day that sampling began on a 24-hour clock in Local Standard Time.
-----------------	--------------------------------------------------------------------------------

“

However, background is characterized as a source in AERMOD. According to

<https://www.epa.gov/sites/production/files/2016-06/documents/so2modelingtad.pdf>

“...any input emissions to AERMOD are input as hour-ending. If the input emissions are hour-beginning, the hour should be adjusted to hour-ending.”

Also,

## 8.2 Time reporting methodologies

The conventions regarding reporting time differ between ambient air quality monitoring, where the observation time is based on the hour-beginning convention, and meteorological monitoring, where the observation is based on the hour-ending time. Thus, ambient monitoring data reported for hour 00 should be paired with meteorological data for hour 01, etc. This is important when incorporating time-varying background concentrations in the AERMOD calculations, which AERMOD allows.

The first value in the background file should be for hour ending 0100. As a check, this is also consistent with how the Lakes AERMOD View software handles input of time varying background concentrations..

Let us know if you have any follow-up questions.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Hurt, Charles [<mailto:HURT@adeq.state.ar.us>]  
**Sent:** Monday, August 29, 2016 3:52 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Subject:** SO2 Area Designation Including Background Concentrations in AERMOD Input files

Erik,

I've got a quick question. I have been working with David Clark on the SO2 NAAQS designations for Arkansas. Some of the modeling protocols include background concentrations by season hour of day. Below is from an AERMOD input file.

**\*\* Winter**

BACKGRND SEASHR 6.89 7.85 7.33 6.89 8.55 9.6

BACKGRND SEASHR 9.6 8.99 7.5 8.38 9.16 10.73

BACKGRND SEASHR 9.69 10.56 10.03 9.42 7.15 7.5

BACKGRND SEASHR 9.25 12.3 9.07 6.11 6.46 7.24

Of the 24 values above, does the highlighted (the first value) correspond with the hours "0:00" (Local Time) that are in the monitor data files at the AQS website

([http://aqsdrl.epa.gov/aqsweb/aqstmp/airdata/download\\_files.html](http://aqsdrl.epa.gov/aqsweb/aqstmp/airdata/download_files.html)) ?

Similarly, does the highlighted (the very last value) correspond with the hours “23:00” (Local Time)?

If you can confirm I got it right or clarify what is correct I would be much appreciative.

Thanks.

Charles Hurt, P.E.

Engineer, Air Division

Arkansas Department of Environmental Quality

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PHONE: (501) 682-0804

FAX: (501) 682-0753

EMAIL: [hurt@adeq.state.ar.us](mailto:hurt@adeq.state.ar.us)

**To:** Hurt, Charles[HURT@adeq.state.ar.us]  
**Cc:** Imhoff, Robert[imhoff.robert@epa.gov]  
**From:** Snyder, Erik  
**Sent:** Thur 9/1/2016 8:11:38 PM  
**Subject:** RE: SO2 Area Designation Including Background Concentrations in AERMOD Input files

Hi Charles,

Bob helped confirm my memory on this issue and pulled this summary together. Hope this summary on the topic helps.

In AQS an hour is defined as hour beginning and the time zone is local standard time.

From [https://aqs.epa.gov/aqsweb/documents/AQS\\_Format.html](https://aqs.epa.gov/aqsweb/documents/AQS_Format.html)

“

12    **Start Time**    The time of day that sampling began on a 24-hour clock in Local Standard Time.

“

However, background is characterized as a source in AERMOD. According to

<https://www.epa.gov/sites/production/files/2016-06/documents/so2modelingtad.pdf>

“...any input emissions to AERMOD are input as hour-ending. If the input emissions are hour-beginning, the hour should be adjusted to hour-ending.”

Also,

## **8.2 Time reporting methodologies**

The conventions regarding reporting time differ between ambient air quality monitoring, where the observation time is based on the hour-beginning convention, and meteorological monitoring, where the observation is based on the hour-ending time. Thus, ambient monitoring data reported for hour 00 should be paired with meteorological data for hour 01, etc. This is important when incorporating time-varying background concentrations in the AERMOD calculations, which AERMOD allows.

The first value in the background file should be for hour ending 0100. As a check, this is also consistent with how the Lakes AERMOD View software handles input of time varying background concentrations..

Let us know if you have any follow-up questions.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Hurt, Charles [mailto:HURT@adeq.state.ar.us]  
**Sent:** Monday, August 29, 2016 3:52 PM  
**To:** Snyder, Erik <snyder.erik@epa.gov>  
**Subject:** SO2 Area Designation Including Background Concentrations in AERMOD Input files

Erik,

I've got a quick question. I have been working with David Clark on the SO2 NAAQS designations for Arkansas. Some of the modeling protocols include background concentrations by season hour of day. Below is from an AERMOD input file.

**\*\* Winter**

BACKGRND SEASHR 6.89 7.85 7.33 6.89 8.55 9.6

BACKGRND SEASHR 9.6 8.99 7.5 8.38 9.16 10.73

BACKGRND SEASHR 9.69 10.56 10.03 9.42 7.15 7.5

BACKGRND SEASHR 9.25 12.3 9.07 6.11 6.46 7.24

Of the 24 values above, does the highlighted (the first value) correspond with the hours "0:00" (Local Time) that are in the monitor data files at the AQS website ([http://aqsdrl.epa.gov/aqsweb/aqstmp/airdata/download\\_files.html](http://aqsdrl.epa.gov/aqsweb/aqstmp/airdata/download_files.html)) ?

Similarly, does the highlighted (the very last value) correspond with the hours "23:00" (Local Time)?

If you can confirm I got it right or clarify what is correct I would be much appreciative.

Thanks.

Charles Hurt, P.E.

Engineer, Air Division

Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR 72118

PHONE: (501) 682-0804

FAX: (501) 682-0753

EMAIL: [hurt@adeq.state.ar.us](mailto:hurt@adeq.state.ar.us)

**To:** Vennetta Hayes[Vennetta.Hayes@LA.GOV]; Feldman, Michael[Feldman.Michael@epa.gov]; Imhoff, Robert[imhoff.robert@epa.gov]  
**From:** Snyder, Erik  
**Sent:** Wed 8/31/2016 3:43:13 PM  
**Subject:** RE: Calcasieu Parish SO2 Stakeholder Group: Meeting Follow-Up

Can you have them confirm the Nelson and Nisco site centerpoints? I was under the impression that the actual sources (using google earth and what looked like stack locations) were even closer together.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Vennetta Hayes [mailto:Vennetta.Hayes@LA.GOV]  
**Sent:** Wednesday, August 31, 2016 10:07 AM  
**To:** Feldman, Michael <Feldman.Michael@epa.gov>; Imhoff, Robert <imhoff.robert@epa.gov>; Snyder, Erik <snyder.erik@epa.gov>  
**Subject:** FW: Calcasieu Parish SO2 Stakeholder Group: Meeting Follow-Up

This Calcasieu map may be helpful.

**From:** Mindi Faubion, PE [mailto:[mindifaubion@providenceeng.com](mailto:mindifaubion@providenceeng.com)]  
**Sent:** Tuesday, August 30, 2016 1:11 PM  
**To:** Vivian Aucoin; Vennetta Hayes  
**Cc:** Kyle Beall  
**Subject:** Calcasieu Parish SO2 Stakeholder Group: Meeting Follow-Up

Vivian and Vennetta –

As reviewed and discussed in our meeting earlier today, I am forwarding along the attached map for the Calcasieu Parish SO2 Stakeholder group which shows:

1. The fencelines for all facilities in the Calcasieu Parish area that are included in the ambient monitor siting analysis
2. 20km circles around each DRR source
3. Distances between the furthest DRR sources
4. The locations of the current monitors in the area

Thanks,

**Mindi Faubion, PE**

Managing Engineer – Air Quality

[mindifaubion@providenceeng.com](mailto:mindifaubion@providenceeng.com)

Main: 225-766-7400

Fax: 225-766-7440

[www.providenceeng.com](http://www.providenceeng.com)

1201 Main Street, Baton Rouge, LA 70802

Providence Engineering and Environmental Group LLC



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**To:** Bates, Rita, NMENV[Rita.Bates@state.nm.us]; Donaldson, Guy[Donaldson.Guy@epa.gov]  
**Cc:** Hollenberg, Cindy, NMENV[Cindy.Hollenberg@state.nm.us]; Heath, David, NMENV[david.heath@state.nm.us]; Sufi Mustafa[Sufi.Mustafa@state.nm.us]  
**From:** Snyder, Erik  
**Sent:** Mon 8/22/2016 3:14:22 PM  
**Subject:** RE: SO2 Data Requirements Rule Source Modeling Protocol

Hi,

We have been swamped with things but are almost done with review of your protocol. We should be sending our comments later today (not many so far) and we can follow-up with a call with Sufi and others to discuss.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Bates, Rita, NMENV [mailto:Rita.Bates@state.nm.us]  
**Sent:** Thursday, August 18, 2016 3:49 PM  
**To:** Snyder, Erik <snyder.erik@epa.gov>; Donaldson, Guy <Donaldson.Guy@epa.gov>  
**Cc:** Hollenberg, Cindy, NMENV <Cindy.Hollenberg@state.nm.us>; Heath, David, NMENV <david.heath@state.nm.us>  
**Subject:** SO2 Data Requirements Rule Source Modeling Protocol

Hi Erik & Guy,

We submitted the source modeling protocol for San Juan Generating Station to EPA Region 6 in June. We haven't heard anything from you so are assuming our protocol is sufficient. Unless I hear differently from you, we are planning to finalize the modeling and prepare the report within the next few weeks.

Let me know if this sounds okay. Thanks!

Rita

Rita Bates

Planning Section Chief

Air Quality Bureau – New Mexico Environment Department

525 Camino de los Marquez, Suite 1

Santa Fe, New Mexico 87505

Phone: 505-476-4304

Fax: 505-476-4375

**To:** Lee Warden[[lee.warden@DEQ.OK.gov](mailto:lee.warden@DEQ.OK.gov)]; Eric Milligan[[Eric.Milligan@deq.ok.gov](mailto:Eric.Milligan@deq.ok.gov)]  
**From:** Snyder, Erik  
**Sent:** Tue 8/16/2016 2:45:44 PM  
**Subject:** FW: updated SO2 modeling TAD available on web  
[so2modelingtad-2016.pdf](#)

FYI – I sent the updated Modeling TAD info last week but you might find some of the language change on receptors interesting. The quote is from pdf page 13 of the document.

For SO<sub>2</sub> designations modeling, the areas to consider for receptor placement are those areas that would be considered ambient air relative to each modeled facility, including other facilities' property. However, for some limited ambient air locations, such as water bodies, receptors can be excluded or ignored in analyses as monitors could not feasibly be placed in those areas. For the purposes of modeling for designations, power inaccessibility or locations in areas located near roadways are not appropriate rationales for excluding receptors... While additional situations not outlined here may apply, appropriate justification for any receptor exclusions should be provided and discussed with the appropriate EPA Regional Modeling Contact...

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Snyder, Erik  
**Sent:** Tuesday, August 09, 2016 9:05 AM  
**To:** Daniel Menendez <[Daniel.Menendez@tceq.texas.gov](mailto:Daniel.Menendez@tceq.texas.gov)>; Daniel Jamieson - TCEQ - Permit modeling ([Daniel.Jamieson@tceq.texas.gov](mailto:Daniel.Jamieson@tceq.texas.gov)) <[Daniel.Jamieson@tceq.texas.gov](mailto:Daniel.Jamieson@tceq.texas.gov)>; Ron Thomas <[Ron.Thomas@tceq.texas.gov](mailto:Ron.Thomas@tceq.texas.gov)>; Jeff Stonesifer <[jstonesifer@cabq.gov](mailto:jstonesifer@cabq.gov)>; Sufi Mustafa <[Sufi.Mustafa@state.nm.us](mailto:Sufi.Mustafa@state.nm.us)>; Eric Peters <[eric.peters@state.nm.us](mailto:eric.peters@state.nm.us)>; Gi-Dong <[gi-dong.kim@state.nm.us](mailto:gi-dong.kim@state.nm.us)>; Eric Milligan <[Eric.Milligan@deq.ok.gov](mailto:Eric.Milligan@deq.ok.gov)>; Joseph Wills ([joseph.wills@deq.ok.gov](mailto:joseph.wills@deq.ok.gov)) <[joseph.wills@deq.ok.gov](mailto:joseph.wills@deq.ok.gov)>; Lee Warden <[lee.warden@DEQ.OK.gov](mailto:lee.warden@DEQ.OK.gov)>; Mark McCorkle ([MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us))

<MAC@adeq.state.ar.us>; Clark, David <CLARKD@adeq.state.ar.us>; vennetta.hayes@la.gov;  
Vivian Aucoin <Vivian.Aucoin@LA.gov>

**Cc:** Mohr, Ashley <Mohr.Ashley@epa.gov>; Imhoff, Robert <imhoff.robert@epa.gov>;  
Feldman, Michael <Feldman.Michael@epa.gov>; Robinson, Jeffrey  
<Robinson.Jeffrey@epa.gov>; Donaldson, Guy <Donaldson.Guy@epa.gov>

**Subject:** FW: updated SO2 modeling TAD available on web

FYI – OAQPS posted an updated version of the 1 Hr SO2 modeling TAD on the web. Minor clarification changes on a few topics. Let me know if you have questions.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Thurman, James

**Subject:** updated SO2 modeling TAD available on web

All,

The SO2 modeling TAD has been updated and is at:  
<https://www.epa.gov/sites/production/files/2016-06/documents/so2modelingtad.pdf>

The TAD has clarifying language about receptor exclusion and also now recommends a minimum of 3 years of emissions/met. This was put in because of potential confusion regarding modeling of 3 years or 5 years for 51.1204 of the DRR.

Please pass along to your states, applicants, etc.

Thanks for everyone's contributions to the update,

James

James A. Thurman, Ph.D.

U.S. EPA/OAQPS/AQAD

Air Quality Modeling Group (C439-01)

109 T.W. Alexander Drive

Research Triangle Park, NC 27711

Phone: (919) 541-2703

Fax: (919) 541-0044

Email: [thurman.james@epa.gov](mailto:thurman.james@epa.gov)

**To:** Warden, Lee[[Lee.Warden@deq.ok.gov](mailto:Lee.Warden@deq.ok.gov)]  
**From:** Snyder, Erik  
**Sent:** Tue 6/7/2016 5:10:16 PM  
**Subject:** RE: leaseair

Thanks Lee. Appreciate the quick response.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Warden, Lee [<mailto:Lee.Warden@deq.ok.gov>]  
**Sent:** Tuesday, June 07, 2016 12:08 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Subject:** RE: leaseair

The PM guidance is too big... look for EPA-452/R-93-008, PM-10 Guideline Document.

**From:** Warden, Lee  
**Sent:** Tuesday, June 07, 2016 11:58 AM  
**To:** [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)  
**Subject:** FW: leaseair

Sorry, I was in a meeting and thought I was communicating with Eric not Erik...

**From:** Warden, Lee  
**Sent:** Tuesday, June 07, 2016 11:00 AM  
**To:** Snyder, Erik  
**Subject:** RE: leaseair

It's in that folder. Same guidance in SO2 and PM.

Sent via the Samsung GALAXY S® 5, an AT&T 4G LTE smartphone

----- Original message -----

**From:** "Snyder, Erik" <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Date:** 06/07/2016 10:43 AM (GMT-06:00)  
**To:** "Warden, Lee" <[Lee.Warden@deq.ok.gov](mailto:Lee.Warden@deq.ok.gov)>  
**Subject:** RE: leaseair

Hi Lee,

I have had a hard time finding an electronic version of the guidance you pulled the following citation. Do you have it electronically that you could forward?

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Warden, Lee [<mailto:Lee.Warden@deq.ok.gov>]  
**Sent:** Monday, May 09, 2016 5:25 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Subject:** FW: leaseair

The SO2 and PM10 guidance from the 90s have this same guidance and I can't find the 87 memo referenced:

17. "We have never either flatly stated that land acquisition in general is acceptable or unacceptable under section 123 of the Clear Air Act...we will review individual situations on a case-by-case basis."  
Memorandum from Tyler, D., OAQPS, to I. Dickstein, Region VIII. April 7, 1987.

17. "We have never either flatly stated that land acquisition in general is acceptable or unacceptable under section 123 of the Clear Air Act...we will review individual situations on a case-by-case basis."  
Memorandum from Tyler, D., OAQPS, to I. Dickstein, Region VIII. April 7, 1987.

---

**From:** Milligan, Eric  
**Sent:** Thursday, March 24, 2016 12:30 PM  
**To:** Warden, Lee; Finley, Laura J.  
**Subject:** RE: leaseair

Also, the Nearair.pdf also lists EPA's concern that "a three-strand barb-wire fence and "no trespassing" signs may not be adequate to keep the general public off the land. Three-strand barb-wire fences are easy to cross and signs could be ignored."

---

**From:** Warden, Lee  
**Sent:** Thursday, March 24, 2016 12:07 PM  
**To:** Finley, Laura J.  
**Cc:** Milligan, Eric  
**Subject:** RE: leaseair

Eric Snyder didn't have anything in particular about leasing and the issue of continuing to farm did not come up. The memo below does address it, but to the extent that Oxbow "hires" the farmer, I don't know if that memo is preventative enough.

I put some documents out on G.

G:\MODEL\Model Guidance\Ambient\_Air

You might review them.

Neaaair.pdf

Discusses leased land to restrict ambient air but attempting to allow the farmer to continue using the land (they can't).

2000H22J.pdf is a 1994 SO2 guideline document:

Addresses ambient air, leasing and land acquisition beginning on page 2-17, section 2.2, 2.2.2, 2.2.4 and 2.2.6. Citations are included at the end of each major sections.

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Covers the same caution on land acquisition, but is specific to PM10.

ccc.pdf

Cautions on land acquisition

Leaseair.pdf

Discusses leased land and ambient air

R1408\_McCourtney\_13\_Sept\_99\_.pdf

Discusses public access

---

**From:** Finley, Laura J.  
**Sent:** Thursday, March 24, 2016 10:44 AM  
**To:** Warden, Lee  
**Subject:** FW: leaseair

See below. Have you heard anything from EPA regarding leasing lands, particularly the ability of the farmer to continue farming?

Thanks,

Laura J. Finley

---

**From:** Miller, Madison B.  
**Sent:** Thursday, March 24, 2016 10:43 AM  
**To:** Finley, Laura J.  
**Subject:** RE: leaseair

Off the top of my head—

This document pertains to PSD source impact analyses, not NAAQS analyses. Lee mentioned this document after our first call with Oxbow, specifically that the PSD source impact was the only instance she knew of EPA discussing leased lands. She called EPA a couple weeks ago to find out whether it would apply in our current NAAQS situation. I don't know if they ever got back to her, but that is something we should follow up on.

**Madison Miller**

Attorney, Office of the General Counsel

Regional Office at Tulsa, Air Quality Division

Oklahoma Dept. of Environmental Quality

3105 East Skelly Drive, Suite 200

Tulsa, Oklahoma 74105

(T) 918.293.1625

(F) 918.293.1631

**From:** Finley, Laura J.  
**Sent:** Thursday, March 24, 2016 9:36 AM  
**To:** Miller, Madison B.  
**Subject:** FW: leaseair

Will you review this and let me know if you think this actually can be applied to our situation? Also, the picture with the dots showing the highest impact areas is a page in what Joe sent to us prior to the Oxbow meeting (March 9 email). It's toward the end of the document.

Laura J. Finley

---

**From:** Milligan, Eric  
**Sent:** Wednesday, March 23, 2016 2:21 PM  
**To:** Finley, Laura J.; Miller, Madison B.; Bradley, Cheryl  
**Subject:** leaseair

Here is the document that I believe they were referencing in the meeting in regards to ambient air.

<< File: leaseair.pdf >>

Page 8, Section 3

... the general public may not include mail carriers, equipment and product suppliers, maintenance and repair persons, as well as persons who are permitted to enter restricted land for the business benefit of the person who has the power to control access to the land. For example,

contractors or delivery persons that are expressly granted access to a plant site by the lessor are not the general public, but instead are considered "business invitees."

**To:** Warden, Lee[[Lee.Warden@deq.ok.gov](mailto:Lee.Warden@deq.ok.gov)]  
**From:** Snyder, Erik  
**Sent:** Tue 6/7/2016 3:43:54 PM  
**Subject:** RE: leaseair

Hi Lee,

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Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
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**From:** Warden, Lee [<mailto:Lee.Warden@deq.ok.gov>]  
**Sent:** Monday, May 09, 2016 5:25 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Subject:** FW: leaseair

The SO2 and PM10 guidance from the 90s have this same guidance and I can't find the 87 memo referenced:

2.2.6 Land Acquisition. Land acquisition and removal of the area from ambient air is not automatically considered a dispersion technique prohibited by section 123; this situation is reviewed on a case-by-case basis. (Also see discussion on stack height regulations, section 5.) In only a few instances has the EPA tolerated land acquisition to contain modeled violations of the NAAQS.<sup>17</sup>

17. "We have never either flatly stated that land acquisition in general is acceptable or unacceptable under section 123 of the Clear Air Act...we will review individual situations on a case-by-case basis."  
Memorandum from Tyler, D., OAQPS, to I. Dickstein, Region VIII. April 7, 1987.

---

**From:** Milligan, Eric  
**Sent:** Thursday, March 24, 2016 12:30 PM  
**To:** Warden, Lee; Finley, Laura J.  
**Subject:** RE: leaseair

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**Sent:** Thursday, March 24, 2016 12:07 PM  
**To:** Finley, Laura J.  
**Cc:** Milligan, Eric  
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You might review them.

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Discusses public access

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Laura J. Finley

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Attorney, Office of the General Counsel

Regional Office at Tulsa, Air Quality Division

Oklahoma Dept. of Environmental Quality

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Tulsa, Oklahoma 74105

(T) 918.293.1625

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**To:** Warden, Lee[Lee.Warden@deq.ok.gov]  
**From:** Snyder, Erik  
**Sent:** Mon 5/9/2016 11:44:30 PM  
**Subject:** RE: leaseair

Thanks Lee.

-E

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

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Laura J. Finley

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**From:** Miller, Madison B.  
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**To:** Finley, Laura J.  
**Subject:** RE: leaseair

Off the top of my head—

This document pertains to PSD source impact analyses, not NAAQS analyses. Lee mentioned this document after our first call with Oxbow, specifically that the PSD source impact was the only instance she knew of EPA discussing leased lands. She called EPA a couple weeks ago to find out whether it would apply in our current NAAQS situation. I don't know if they ever got back to her, but that is something we should follow up on.

**Madison Miller**

Attorney, Office of the General Counsel  
Regional Office at Tulsa, Air Quality Division  
Oklahoma Dept. of Environmental Quality  
3105 East Skelly Drive, Suite 200  
Tulsa, Oklahoma 74105  
(T) 918.293.1625  
(F) 918.293.1631

---

**From:** Finley, Laura J.  
**Sent:** Thursday, March 24, 2016 9:36 AM  
**To:** Miller, Madison B.  
**Subject:** FW: leaseair

Will you review this and let me know if you think this actually can be applied to our situation?  
Also, the picture with the dots showing the highest impact areas is a page in what Joe sent to us prior to the Oxbow meeting (March 9 email). It's toward the end of the document.

Laura J. Finley

---

**From:** Milligan, Eric  
**Sent:** Wednesday, March 23, 2016 2:21 PM  
**To:** Finley, Laura J.; Miller, Madison B.; Bradley, Cheryl  
**Subject:** leaseair

Here is the document that I believe they were referencing in the meeting in regards to ambient air.

<< File: leaseair.pdf >>

Page 8, Section 3

... the general public may not include mail carriers, equipment and product suppliers, maintenance and repair persons, as well as persons who are permitted to enter restricted land for the business benefit of the person who has the power to control access to the land. For example, contractors or delivery persons that are expressly granted access to a plant site by the lessor are not the general public, but instead are considered "business invitees."

**To:** Vennetta Hayes[Vennetta.Hayes@LA.GOV]  
**From:** Snyder, Erik  
**Sent:** Wed 4/20/2016 6:10:05 PM  
**Subject:** RE: data transfer

St. Bernard files first I guess for the different emission scenarios, then whichever SO2 modeling or monitoring siting materials that you think you need the quickest feedback or has more challenging issues.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Vennetta Hayes [mailto:Vennetta.Hayes@LA.GOV]  
**Sent:** Wednesday, April 20, 2016 1:07 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Subject:** RE: data transfer

I have. Which files do you want me to send you first?

**From:** Snyder, Erik [mailto:[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)]  
**Sent:** Wednesday, April 20, 2016 12:47 PM  
**To:** Vennetta Hayes  
**Subject:** data transfer

Hi Vennetta,

Was wondering if you had any luck setting up the file transfer mechanism.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler

EPA Region 6

Phone: 214-665-7305

Fax: 214-665-7263

email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** David J Long[djlong@aep.com]  
**Cc:** William Matthews (william.matthews@cleco.com)  
(william.matthews@cleco.com)[william.matthews@cleco.com]; Ashley N Ullstrom[anullstrom@aep.com];  
'Pakrasi, Arijit (Arijit.Pakrasi@cbi.com)' (Arijit.Pakrasi@cbi.com)[Arijit.Pakrasi@cbi.com];  
vennetta.hayes@la.gov[vennetta.hayes@la.gov]  
**From:** Snyder, Erik  
**Sent:** Thur 4/7/2016 8:26:18 PM  
**Subject:** RE: File('Dolet Hills Modeling.zip') from AEP is ready to download

David,

Thanks for getting back to me with your detailed response and summary of the differences with the Sierra Club modeling. We will work to review and will get back with you if we have any follow-up questions.

Thanks,  
Erik

Erik Snyder  
Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: snyder.erik@epa.gov

-----Original Message-----

From: David J Long [mailto:djlong@aep.com]  
Sent: Thursday, April 07, 2016 2:42 PM  
To: Snyder, Erik <snyder.erik@epa.gov>  
Cc: William Matthews (william.matthews@cleco.com) (william.matthews@cleco.com)  
<william.matthews@cleco.com>; Ashley N Ullstrom <anullstrom@aep.com>; 'Pakrasi, Arijit  
(Arijit.Pakrasi@cbi.com)' (Arijit.Pakrasi@cbi.com) <Arijit.Pakrasi@cbi.com>; vennetta.hayes@la.gov  
Subject: RE: File('Dolet Hills Modeling.zip') from AEP is ready to download

Erik,

In response to your question, the spreadsheet system we used to develop the "Full Actual" case for Dolet Hills is included in the archive in the Emissions Processing directory. It contains the raw CEMS data we were given by CLECO as the first sheet in the Spreadsheet file (AEP is a part owner of Dolet Hills, but is not the operating owner - this means we don't receive a feed of the CEMS and EDR data from the plant like we do from AEP operated plants). As such, I'm not sure if the data we received from CLECO was an exact copy of what was in the EDR filed under Part 75 or raw CEMS data that may not have all the Part 75 data handling conventions applied (Bias Adjustment Factors, Missing Data Substitutions, Diluent Capping, etc). In order to give you a better understanding of the ways we handle CEMS data to generate an emissions inventory for modeling, I'm attaching a paper I'm presenting next week in Chapel Hill, NC at the AWMA Modeling Specialty Conference on our CEMS processing methods. This paper is referenced in the Technical Note that summarizes our work.

In response to your question about the differences in the two inventories, I did pull the processing spreadsheet we used and the Sierra Club inventory and made a gross summation of emissions to see how much different the three year emissions were. The input file we created had a total of 48053.63 tons and the Sierra Club file had 49676.72 tons across the three year period.

I took a quick look at a few places in the files to see what might be causing this deviation and I'm thinking that there is some kind of a bias adjustment factor difference between the two datasets that comes and goes over time. My reason for this suspicion is that there are times where the two files have virtually the

same lb/hr emissions data and other places where there is the appearance of a consistent bias in the emissions data (that appears to be on the order of about 2 to 3% in most occurrences) and exists across the load range. From the information available to us, we are not able to determine if there is a Part 75 bias factor(s) in play and if it is being applied to the raw flow data, SO2 data, or both.

However, with the different simulations I've made using various combinations of data for Dolet Hills (supplied in the archive), I would not expect this difference in emissions to result in a change in the conclusion that when the correct operating temperature and flow is input into the model (including startup periods and the shutdown hour), that the area models attainment with the 1-Hour Standard regardless of the background used. The temperature the Sierra Club used as a full load temperature was 161 F, where the range from the CEMS data was typically in the range of 185 to 220 F at full load (lower at reduced loads). The actual flows and temperatures drove the exit velocities at full load up to 90+ fps from the roughly 85 fps used by the Sierra Club. Due to the measured flows across the load range being higher than assumed by the Sierra Club, it appears that except under low load and startup conditions the operating flows were typically within 5 fps of the Sierra Club value on the low end and up to about 20 fps higher at full load.

If you have any other questions as you review this work, please let me know.

Dave

David J. Long, PE  
Environmental Engineer - Principal  
Air Quality Services Section  
American Electric Power  
1 Riverside Plaza  
Columbus, OH 43215  
Phone - 614-716-1245  
Audinet - 200-1245  
Fax - 614-716-2255

-----Original Message-----

From: Snyder, Erik [mailto:snyder.erik@epa.gov]  
Sent: Thursday, April 07, 2016 1:53 PM  
To: David J Long  
Cc: Mohr, Ashley; Imhoff, Robert  
Subject: RE: File('Dolet Hills Modeling.zip') from AEP is ready to download

This is an EXTERNAL email. STOP. THINK before you CLICK links or OPEN attachments.

\*\*\*\*\*

Thanks David. Wanted to confirm your email and I was able to download the file and unzip. Based on the readme.txt file, I did have a general question about the Full Actual Emissions, do you have a comparison file or some details to what was off with the emissions rates from Sierra Club as I thought they used CEM data. I have not received the full comment package yet so understand some of the details may be in the comments but didn't think you were able to provide spreadsheets or zip files to the docket.

Thanks,  
Erik

Erik Snyder  
Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305

Fax: 214-665-7263  
email: snyder.erik@epa.gov

-----Original Message-----

From: djlong@aep.com [mailto:djlong@aep.com]  
Sent: Thursday, April 07, 2016 12:26 PM  
To: Snyder, Erik <snyder.erik@epa.gov>  
Subject: File('Dolet Hills Modeling.zip') from AEP is ready to download

Use the link below to download your file. The file is available until 04/14/2016.

<https://p2p.aep.com:443/AEPLargeFile/fileDownload.dsp?isEncrypted=true&isEnSet=true&fileStage=7&fileName=XOCzD3%2FktSoLZ%2BSDNBhGlv%2FmHiOmIUdyj1EunPcAQxNhUk76M0aoQ%3D%3D&foP=bac60c80fce511e5a0a4dd023886f5419&version=v2>

File Size = 53985 kb

Comments: Sorry for the slight delay. I discovered that I had never had Ashley send my the emission spreadsheet used to generate the hourly emission inventory, just the final output file. I had her send it to me and included it in the archive. If you have any questions, please let me know.

David Long  
614-716-1245

(This note processed by "p2p.aep.com")

**To:** Vennetta Hayes[Vennetta.Hayes@LA.GOV]  
**From:** Snyder, Erik  
**Sent:** Wed 3/16/2016 6:20:45 PM  
**Subject:** RE: questions  
[DL Compliance Report.pdf](#)  
[SC Cover Letter.pdf](#)

I have the Dolet modeling files zipped and are approximately 50MB and 80 MB. What is the best way to get the info to you? I attached the report and cover letter in case you don't have them. I will go back and look at the IP draft protocol.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Vennetta Hayes [mailto:Vennetta.Hayes@LA.GOV]  
**Sent:** Wednesday, March 16, 2016 12:57 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Subject:** RE: questions

I sent you a protocol from International Paper and also we were trying to find out about the modeling submitted by Sierra Club in December.

**From:** Snyder, Erik [mailto:[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)]  
**Sent:** Wednesday, March 16, 2016 12:37 PM  
**To:** Vennetta Hayes  
**Subject:** questions

Hi Vennetta,

Got a note from our Air branch manager indicating you had some modeling questions that you needed input for something on a tight timeline. I am tied up until 2-2:15 timeframe, can I call you after that? Can you tell what the topics are?

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Warden, Lee[[Lee.Warden@deq.ok.gov](mailto:Lee.Warden@deq.ok.gov)]  
**Cc:** Milligan, Eric[[Eric.Milligan@deq.ok.gov](mailto:Eric.Milligan@deq.ok.gov)]; Bradley, Cheryl[[Cheryl.Bradley@deq.ok.gov](mailto:Cheryl.Bradley@deq.ok.gov)]  
**From:** Snyder, Erik  
**Sent:** Tue 2/2/2016 7:26:53 PM  
**Subject:** RE: Modeling Protocol

Thanks for the updated version. I'll look over quickly and then forward this to Louisiana and will cc you all.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Warden, Lee [<mailto:Lee.Warden@deq.ok.gov>]  
**Sent:** Tuesday, February 02, 2016 1:23 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>  
**Cc:** Milligan, Eric <[Eric.Milligan@deq.ok.gov](mailto:Eric.Milligan@deq.ok.gov)>; Bradley, Cheryl <[Cheryl.Bradley@deq.ok.gov](mailto:Cheryl.Bradley@deq.ok.gov)>  
**Subject:** FW: Modeling Protocol

Erik,

This is our latest revision. Shouldn't be very different from the one previously submitted.

Thanks,

Lee Warden, P.E.

Engineering Unit Supervisor

Air Quality Division

Oklahoma Department of Environmental Quality

405.702.4182

**From:** Milligan, Eric

**Sent:** Wednesday, December 30, 2015 1:35 PM

**To:** Warden, Lee; Wills, Joseph

**Cc:** Bradley, Cheryl

**Subject:** Modeling Protocol

Attached is the most recent version of the modeling protocol for the 2010 1-hour SO<sub>2</sub> NAAQS Data Requirements Rule.

Not much has really changed so far.

Really just some editorial changes to the wording.

**To:** Zarena Post[zarena.post@tceq.texas.gov]  
**Cc:** Thuy Phi[Thuy.Phi@Tceq.Texas.Gov]; Shantha Daniel[shantha.daniel@tceq.texas.gov]; Mark McCorkle (MAC@adeq.state.ar.us)[MAC@adeq.state.ar.us]; Clark, David[CLARKD@adeq.state.ar.us]; Sufi Mustafa[Sufi.Mustafa@state.nm.us]; Eric Peters[eric.peters@state.nm.us]; Gi-Dong[gi-dong.kim@state.nm.us]  
**From:** Snyder, Erik  
**Sent:** Wed 1/20/2016 3:01:19 PM  
**Subject:** RE: 1/20 & 21 Region 6 Air Modeling Meeting  
R6 Modeling Workshop-GMB MCH Update.pptx

Here is George's presentation for this morning.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Zarena Post [mailto:zarena.post@tceq.texas.gov]  
**Sent:** Wednesday, January 20, 2016 8:25 AM  
**To:** Snyder, Erik <snyder.erik@epa.gov>  
**Cc:** Thuy Phi <Thuy.Phi@Tceq.Texas.Gov>; Shantha Daniel <shantha.daniel@tceq.texas.gov>  
**Subject:** RE: 1/20 & 21 Region 6 Air Modeling Meeting

Hi, Erik

Thanks for making a call-in number available!

In addition to myself, Thuy Phi and Shantha Daniel will also be listening in.

Thanks!

Zarena

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]  
**Sent:** Tuesday, January 19, 2016 2:50 PM  
**To:** Zarena Post <[zarena.post@tceq.texas.gov](mailto:zarena.post@tceq.texas.gov)>; Sufi Mustafa <[Sufi.Mustafa@state.nm.us](mailto:Sufi.Mustafa@state.nm.us)>; Mark McCorkle ([MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us)) <[MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us)>; Clark, David <[CLARKD@adeq.state.ar.us](mailto:CLARKD@adeq.state.ar.us)>; Eric Peters <[eric.peters@state.nm.us](mailto:eric.peters@state.nm.us)>; Gi-Dong <[gi-dong.kim@state.nm.us](mailto:gi-dong.kim@state.nm.us)>  
**Subject:** RE: 1/20 & 21 Region 6 Air Modeling Meeting

Forgot to mention if you will have others listening in either day, please let me know as I will probably be sending the presentations out shortly before the start of the workshop each day.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Snyder, Erik  
**Sent:** Tuesday, January 19, 2016 2:40 PM  
**To:** 'Zarena Post' <[zarena.post@tceq.texas.gov](mailto:zarena.post@tceq.texas.gov)>; Sufi Mustafa <[Sufi.Mustafa@state.nm.us](mailto:Sufi.Mustafa@state.nm.us)>; Mark McCorkle ([MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us)) <[MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us)>; Clark, David <[CLARKD@adeq.state.ar.us](mailto:CLARKD@adeq.state.ar.us)>  
**Cc:** [vennetta.hayes@la.gov](mailto:vennetta.hayes@la.gov); 'Yvette Olmos' <[Yvette.Olmos@LA.GOV](mailto:Yvette.Olmos@LA.GOV)>; 'Tien Nguyen' <[tien.nguyen@LA.GOV](mailto:tien.nguyen@LA.GOV)>; 'Ron Thomas' <[Ron.Thomas@tceq.texas.gov](mailto:Ron.Thomas@tceq.texas.gov)>; 'jim.smith@tceq.texas.gov' <[jim.smith@tceq.texas.gov](mailto:jim.smith@tceq.texas.gov)>; 'Daniel Menendez'

<Daniel.Menendez@tceq.texas.gov>; 'Eric Milligan' <Eric.Milligan@deq.ok.gov>; 'Joseph Wills' <joseph.wills@deq.ok.gov>; 'Daniel Jamieson' <Daniel.Jamieson@tceq.texas.gov>; 'Dianne.Anderson@tceq.texas.gov' <Dianne.Anderson@tceq.texas.gov>; 'miranda.kosty@tceq.texas.gov' <miranda.kosty@tceq.texas.gov>; 'kathy.wilson@tceq.texas.gov' <kathy.wilson@tceq.texas.gov>  
**Subject:** 1/20 & 21 Region 6 Air Modeling Meeting

Hi,

Attached is the latest version of the agenda for the Region6 air modeling workshop/meeting tomorrow and Thursday. Most of the topics in the afternoon are SO2, but we also will have several discussions in the morning that you may be interested in listening/participating. I have included my conference call number and we will have it open for the entire meeting so feel free to call in Ex. 6 - Personal Privacy Code Ex. 6 - Personal Privacy I am still working on some of the powerpoints and will circulate those so people can follow along on the phone.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Zarena Post[zarena.post@tceq.texas.gov]; Sufi Mustafa[Sufi.Mustafa@state.nm.us]; Mark McCorkle (MAC@adeq.state.ar.us)[MAC@adeq.state.ar.us]; Clark, David[CLARKD@adeq.state.ar.us]; Eric Peters[eric.peters@state.nm.us]; Gi-Dong[gi-dong.kim@state.nm.us]  
**From:** Snyder, Erik  
**Sent:** Tue 1/19/2016 8:50:02 PM  
**Subject:** RE: 1/20 & 21 Region 6 Air Modeling Meeting  
R6 Modeling Mtg-AGENDA 2016 -draft.docx

Forgot to mention if you will have others listening in either day, please let me know as I will probably be sending the presentations out shortly before the start of the workshop each day.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Snyder, Erik  
**Sent:** Tuesday, January 19, 2016 2:40 PM  
**To:** 'Zarena Post' <zarena.post@tceq.texas.gov>; Sufi Mustafa <Sufi.Mustafa@state.nm.us>; Mark McCorkle (MAC@adeq.state.ar.us) <MAC@adeq.state.ar.us>; Clark, David <CLARKD@adeq.state.ar.us>  
**Cc:** vennetta.hayes@la.gov; 'Yvette Olmos' <Yvette.Olmos@LA.GOV>; 'Tien Nguyen' <tien.nguyen@LA.GOV>; 'Ron Thomas' <Ron.Thomas@tceq.texas.gov>; 'jim.smith@tceq.texas.gov' <jim.smith@tceq.texas.gov>; 'Daniel Menendez' <Daniel.Menendez@tceq.texas.gov>; 'Eric Milligan' <Eric.Milligan@deq.ok.gov>; 'Joseph Wills' <joseph.wills@deq.ok.gov>; 'Daniel Jamieson' <Daniel.Jamieson@tceq.texas.gov>; 'Dianne.Anderson@tceq.texas.gov' <Dianne.Anderson@tceq.texas.gov>; 'miranda.kosty@tceq.texas.gov' <miranda.kosty@tceq.texas.gov>; 'kathy.wilson@tceq.texas.gov' <kathy.wilson@tceq.texas.gov>  
**Subject:** 1/20 & 21 Region 6 Air Modeling Meeting

Hi,

Attached is the latest version of the agenda for the Region6 air modeling workshop/meeting tomorrow and Thursday. Most of the topics in the afternoon are SO<sub>2</sub>, but we also will have several discussions in the morning that you may be interested in listening/participating. I have included my conference call number and we will have it open for the entire meeting so feel free to call in (Ex. 6 - Personal Privacy) Code: (Ex. 6 - Personal Privacy) I am still working on some of the powerpoints and will circulate those so people can follow along on the phone.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Zarena Post[zarena.post@tceq.texas.gov]; Sufi Mustafa[Sufi.Mustafa@state.nm.us]; Mark McCorkle (MAC@adeq.state.ar.us)[MAC@adeq.state.ar.us]; Clark, David[CLARKD@adeq.state.ar.us]  
**Cc:** vennetta.hayes@la.gov[vennetta.hayes@la.gov]; Yvette Olmos[Yvette.Olmos@LA.GOV]; Tien Nguyen[tien.nguyen@LA.GOV]; 'Ron Thomas'[Ron.Thomas@tceq.texas.gov]; jim.smith@tceq.texas.gov[jim.smith@tceq.texas.gov]; Daniel Menendez[Daniel.Menendez@tceq.texas.gov]; Eric Milligan[Eric.Milligan@deq.ok.gov]; Joseph Wills[joseph.wills@deq.ok.gov]; Daniel Jamieson[Daniel.Jamieson@tceq.texas.gov]; Dianne.Anderson@tceq.texas.gov[Dianne.Anderson@tceq.texas.gov]; miranda.kosty@tceq.texas.gov[miranda.kosty@tceq.texas.gov]; kathy.wilson@tceq.texas.gov[kathy.wilson@tceq.texas.gov]  
**From:** Snyder, Erik  
**Sent:** Tue 1/19/2016 8:39:51 PM  
**Subject:** 1/20 & 21 Region 6 Air Modeling Meeting  
R6 Modeling Mtg-AGENDA 2016 -draft.docx

Hi,

Attached is the latest version of the agenda for the Region6 air modeling workshop/meeting tomorrow and Thursday. Most of the topics in the afternoon are SO2, but we also will have several discussions in the morning that you may be interested in listening/participating. I have included my conference call number and we will have it open for the entire meeting so feel free to call in ( Ex. 6 - Personal Privacy Code Ex. 6 - Personal Privacy ) I am still working on some of the powerpoints and will circulate those so people can follow along on the phone.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Ron Thomas[Ron.Thomas@tceq.texas.gov]  
**Cc:** Feldman, Michael[Feldman.Michael@epa.gov]  
**From:** Snyder, Erik  
**Sent:** Wed 1/13/2016 7:37:48 PM  
**Subject:** RE: R6 Modeling workshop

Planning on using my call in number.

Ex. 6 - Personal Privacy

Code

Ex. 6 - Personal Privacy

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Ron Thomas [mailto:Ron.Thomas@tceq.texas.gov]  
**Sent:** Wednesday, January 13, 2016 12:30 PM  
**To:** Snyder, Erik  
**Cc:** Feldman, Michael  
**Subject:** RE: R6 Modeling workshop

Zarena asked if you'll have a call-in number?

**From:** Ron Thomas  
**Sent:** Tuesday, January 12, 2016 1:37 PM  
**To:** 'Snyder, Erik'  
**Subject:** RE: R6 Modeling workshop

Erik,

We're all booked for the Hotel Indigo, which had at least 7 rooms and took gov't rate.

See you on the 20<sup>th</sup>.

I think the agenda works in general. Examples of the single-source PSD ozone modeling would be helpful (what works for Tier 1 vs having to move to Tier 2).

Would you or Michael Feldman be wanting to discuss how Texas is informing monitor placement with CAMx?

Anything else?

-Ron

**From:** Ron Thomas  
**Sent:** Thursday, January 07, 2016 1:36 PM  
**To:** 'Snyder, Erik'  
**Subject:** RE: R6 Modeling workshop

We'll have rental cars, so I think we can broaden our search. Thanks.

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]  
**Sent:** Thursday, January 07, 2016 1:30 PM  
**To:** Ron Thomas  
**Subject:** RE: R6 Modeling workshop

Not so far. I'll try and look more tonight to see if there is an option that would be off the train.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Ron Thomas [<mailto:Ron.Thomas@tceq.texas.gov>]  
**Sent:** Thursday, January 07, 2016 1:28 PM  
**To:** Snyder, Erik  
**Subject:** RE: R6 Modeling workshop

Thanks, we'll try the LaQuinta. Daniel says there's nothing with availability near downtown at our \$138 state rate, but I don't know that he tried this LaQuinta. Anyone else said they've had difficulty?

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]  
**Sent:** Thursday, January 07, 2016 10:57 AM  
**To:** Ron Thomas  
**Subject:** RE: R6 Modeling workshop

Sorry Ron. I hadn't had time to research. Two high end hotels that might have rates would be the Adolphus and Fairmont since Jan is slow. Omni and Sheratons are about 6-8 blocks downtown. If you want to drive there are a number of hotels near I-35 just north of downtown. I also found a la quinta on north 75 that looked promising

### **La Quinta Inn Dallas Uptown**

**2.5 out of 5**

**[Close map](#)**

Close Map

4440 N Central Expy Dallas TX 75206 United States of America Travelocity Hotel  
Expert: 1-855-201-7819

Let me know what you find or if you have questions. I wouldn't look on the southside or west of downtown.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Ron Thomas [<mailto:Ron.Thomas@tceq.texas.gov>]  
**Sent:** Thursday, January 07, 2016 10:32 AM  
**To:** Snyder, Erik  
**Subject:** FW: R6 Modeling workshop

Erik,

It looks like the Springhill and the Crown are booked. Any other suggestions?

-Ron

**From:** Daniel Menendez  
**Sent:** Wednesday, January 06, 2016 10:38 AM  
**To:** Ron Thomas  
**Subject:** RE: R6 Modeling workshop

I looked at the fleet reservation spreadsheet and didn't see any cars available. It looks like we will need to rent. We will have three from APD, so it may be best to get two cars.

As for hotels, the crown plaza is the closest hotel with a state rate. It's about a 0.3 mile walk from the EPA offices.

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**Cc:** Daniel Menendez  
**Subject:** RE: R6 Modeling workshop

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Do you think you can reserve a block of rooms at the gov't rate and let us know what that is.

Also, please send us an updated agenda when you have one, since that goes with our travel justification.

We plan to bring 4 from AQD, and Daniel is bringing some from APD, and we plan to drive up on the 19<sup>th</sup>.

Daniel, do we want to try to reserve a van or two cars? Do you know how many from APD?

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**To:** Daniel Menendez; Daniel Jamieson; Ron Thomas; Zarena Post; Jeff Stonesifer; Sufi Mustafa; Eric Peters; Gi-Dong; Eric Milligan; Lee Warden; Thomas Rheaume; [vennetta.hayes@la.gov](mailto:vennetta.hayes@la.gov); Nguyen, Tien; Yvette Olmos; Smith, Jim; Clark, David; Mark McCorkle ([MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us))  
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**Cc:** Mohr, Ashley; Feldman, Michael

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**To:** Vennetta Hayes[Vennetta.Hayes@LA.GOV]  
**Cc:** Eric Milligan[Eric.Milligan@deq.ok.gov]  
**From:** Snyder, Erik  
**Sent:** Wed 1/13/2016 5:17:50 PM  
**Subject:** RE: R6 Modeling workshop

There are some hotels up 75 (north of downtown) that you can check. There are also some hotels up 35 from downtown in the garment district.

Erik Snyder

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**From:** Vennetta Hayes [mailto:Vennetta.Hayes@LA.GOV]  
**Sent:** Wednesday, January 13, 2016 11:09 AM  
**To:** Snyder, Erik  
**Cc:** Eric Milligan  
**Subject:** RE: R6 Modeling workshop

There must be something going on in town. Both hotels are showing no rooms on these dates. I actually can't book until we get travel approval and we have to use a state booking platform. I'll just use the approved rate for the travel request and see what happens later.

**From:** Snyder, Erik [mailto:[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)]  
**Sent:** Wednesday, January 13, 2016 10:45 AM  
**To:** Vennetta Hayes  
**Cc:** Eric Milligan  
**Subject:** RE: R6 Modeling workshop

James got a room at the Hilton Garden Inn downtown 214-299-8982 and the Texas folks received government rate at Hotel Indigo 214-741-7700. Let me know if you don't get a room.

-Erik

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**From:** Vennetta Hayes [<mailto:Vennetta.Hayes@LA.GOV>]  
**Sent:** Wednesday, January 13, 2016 10:35 AM  
**To:** Snyder, Erik; Daniel Menendez; Daniel Jamieson ([Daniel.Jamieson@tceq.state.tx.us](mailto:Daniel.Jamieson@tceq.state.tx.us)); Ron Thomas; Zarena Post; Jeff Stonesifer; Sufi Mustafa; Eric Peters; Gi-Dong; Eric Milligan; Lee Warden; Thomas Rheaume; Nguyen, Tien; Yvette Olmos; Smith, Jim; Clark, David; Mark McCorkle ([MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us))  
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Are there other hotels nearby?

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**From:** Snyder, Erik

**Sent:** Wednesday, December 16, 2015 2:28 PM

**To:** 'Daniel Menendez'; Daniel Jamieson ([Daniel.Jamieson@tceq.state.tx.us](mailto:Daniel.Jamieson@tceq.state.tx.us)); Ron Thomas; Zarena Post; Jeff Stonesifer; Sufi Mustafa; Eric Peters; Gi-Dong; Eric Milligan; Lee Warden; Thomas Rheame; 'vennetta.hayes@la.gov'; Nguyen, Tien; Yvette Olmos; Smith, Jim; 'Clark, David'; Mark McCorkle ([MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us))

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Thanks,

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**Cc:** Eric Milligan[Eric.Milligan@deq.ok.gov]  
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**Sent:** Wed 1/13/2016 4:44:42 PM  
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**From:** Vennetta Hayes [mailto:Vennetta.Hayes@LA.GOV]  
**Sent:** Wednesday, January 13, 2016 10:35 AM  
**To:** Snyder, Erik; Daniel Menendez; Daniel Jamieson (Daniel.Jamieson@tceq.state.tx.us); Ron Thomas; Zarena Post; Jeff Stonesifer; Sufi Mustafa; Eric Peters; Gi-Dong; Eric Milligan; Lee Warden; Thomas Rheaume; Nguyen, Tien; Yvette Olmos; Smith, Jim; Clark, David; Mark McCorkle (MAC@adeq.state.ar.us)  
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**To:** Ron Thomas[Ron.Thomas@tceq.texas.gov]  
**From:** Snyder, Erik  
**Sent:** Thur 1/7/2016 7:29:59 PM  
**Subject:** RE: R6 Modeling workshop

Not so far. I'll try and look more tonight to see if there is an option that would be off the train.

-Erik

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**Sent:** Thursday, January 07, 2016 1:28 PM  
**To:** Snyder, Erik  
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Thanks, we'll try the LaQuinta. Daniel says there's nothing with availability near downtown at our \$138 state rate, but I don't know that he tried this LaQuinta. Anyone else said they've had difficulty?

**From:** Snyder, Erik [mailto:[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)]  
**Sent:** Thursday, January 07, 2016 10:57 AM  
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## La Quinta Inn Dallas Uptown

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Close map

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4440 N Central Expy Dallas TX 75206 United States of America Travelocity Hotel  
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**Subject:** R6 Modeling workshop

Hi,

Wanted to confirm the dates of the 20<sup>th</sup> and 21<sup>st</sup>. We will be on the 12<sup>th</sup> floor and everyone will have to check in on 7<sup>th</sup> floor to get a temporary badge (same procedure as 2013 R/S/L). There is a marriott Springhill suites in the west end that people stayed at in 2013 that is about 4 blocks from the office ( I have not reserved a block of rooms). Depending on when people will get into town we can either start around 8:30 on the 20<sup>th</sup>, or 10 if some people are traveling early morning. We will probably wrap at 3 or 4 on Thursday at the latest. Please send me topics areas you want to cover. I am working off the structure/topics of the R5 workshop as that seemed to go pretty well for them. I will adjust this agenda, but please provide input if there are areas you don't see that you want to cover, etc.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler

EPA Region 6

Phone: 214-665-7305

Fax: 214-665-7263

email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Snyder, Erik

**Sent:** Wednesday, December 16, 2015 2:28 PM

**To:** 'Daniel Menendez'; Daniel Jamieson ([Daniel.Jamieson@tceq.state.tx.us](mailto:Daniel.Jamieson@tceq.state.tx.us)); Ron Thomas; Zarena Post; Jeff Stonesifer; Sufi Mustafa; Eric Peters; Gi-Dong; Eric Milligan; Lee Warden; Thomas Rheaume; 'vennetta.hayes@la.gov'; Nguyen, Tien; Yvette Olmos; Smith, Jim; 'Clark, David'; Mark McCorkle ([MAC@adeq.state.ar.us](mailto:MAC@adeq.state.ar.us))

**Cc:** Mohr, Ashley; Feldman, Michael

**Subject:** RE: Potential R6 Modeling workshop in Dallas in early November

Hi,

Making another run at this. I have locked down conference rooms here at the Region for January 20-21<sup>st</sup> to have a permit modeling workshop with most of the focus on SO2 modeling for CD and DRR sources. Looking at having James Thurman down from RTP and then some others by teleconference or video. Would be 1.5 to two days. I know we are getting towards the holidays but if you can let Ashley and I know if these dates would work by the end of this week, we can make sure James can get his travel done. I am going to be out of pocket for the rest of this week but please follow up with Ashley on any questions.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Daniel Menendez [<mailto:daniel.menendez@tceq.texas.gov>]

**Sent:** Tuesday, September 22, 2015 10:31 AM

**To:** Snyder, Erik

**Cc:** Ron Thomas

**Subject:** RE: Potential R6 Modeling workshop in Dallas in early November

Hi Erik,

Any updates on potential Region 6 modeling meeting?

Thanks,

Daniel

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]

**Sent:** Wednesday, August 19, 2015 11:16 AM

**To:** Daniel Menendez; Daniel Jamieson; Dominic Ruggeri; Ron Thomas; Zarena Post; Jeff Stonesifer; Sufi Mustafa; Eric Peters; Gi-Dong; Eric Milligan; Lee Warden; Thomas Rheaume; [vennetta.hayes@la.gov](mailto:vennetta.hayes@la.gov); Tien Nguyen; Yvette Olmos; Jim Smith

**Cc:** Mohr, Ashley; Feldman, Michael; Robinson, Jeffrey; Donaldson, Guy

**Subject:** Potential R6 Modeling workshop in Dallas in early November

Hi,

We haven't had a Region 6 modelers workshop in Dallas in a while. With the final DRR and proposed changes in App. W, thought it might be a good time to have a meeting here in Dallas. I am not planning on discussing photochemical issues other than maybe secondary pollutant analysis for permits. The main focus would be modeling for the SO<sub>2</sub> sources as part of the SO<sub>2</sub> Phase 3 and 4 designations process (either modeling directly or modeling for monitor locations around a facility). We could also discuss other issues if there is interest. I was thinking some discussion on ozone and PM<sub>2.5</sub> impacts from single source for permitting might and what sources should be included in cumulative analysis are two topics that might also be beneficial. At this time I am targeting the first week in November (11/2-11/5) as possible date(s). Would only plan for 1 or two days within this period but we have locked meeting space for M-R currently. I think we will be able to get one or two people from OAQPS that week to come to

Dallas (James Thurman and/or George Bridgers most likely). They are available for travel and this would be after the close of the proposed changes to App. W, so we could talk about any of the proposed changes.

Please let me know your interest and availability (if this week works and if M-T, T-W or W-R is best). Also any ideas for specific topics/issues.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Daniel Menendez[daniel.menendez@tceq.texas.gov]  
**From:** Snyder, Erik  
**Sent:** Mon 11/30/2015 3:18:24 PM  
**Subject:** RE: Supplemental Modeling for SO2 Designations

Thanks Daniel. Appreciate the work and getting it to us quickly.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Daniel Menendez [mailto:daniel.menendez@tceq.texas.gov]  
**Sent:** Monday, November 30, 2015 9:15 AM  
**To:** Snyder, Erik  
**Cc:** Walker Williamson  
**Subject:** Supplemental Modeling for SO2 Designations

Hello Erik,

Attached is a copy of the letter summarizing the supplemental modeling conducted to address concerns on the representativeness of the meteorological data used in our analyses. A hard copy was mailed on November 24<sup>th</sup>. Please let me know if you have any questions.

Thanks,

Daniel

**To:** Clark, David[CLARKD@adeq.state.ar.us]  
**Cc:** McCorkle, Mark[MAC@adeq.state.ar.us]  
**From:** Snyder, Erik  
**Sent:** Wed 11/18/2015 8:06:59 PM  
**Subject:** RE: EPA/ADEQ/Entergy Call

Thanks David.

Appreciate you and Mark helping to facilitate this work and communications.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Clark, David [mailto:CLARKD@adeq.state.ar.us]  
**Sent:** Wednesday, November 18, 2015 1:53 PM  
**To:** Snyder, Erik  
**Cc:** McCorkle, Mark  
**Subject:** EPA/ADEQ/Entergy Call

Erik,

Attached are Entergy's/ERM's reviews of Sierra Club's 1-hour SO2 modeling of the Entergy facilities. We will also send a CD with ERM's manipulated Sierra Club AERMOD files (adding a culpability analysis for Independence) when we receive them from Entergy.

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR. 72118

U.S.A.

Voice: 501 682-0070

Fax: 501 682-0753

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**From:** Clark, David  
**Sent:** Monday, November 16, 2015 8:56 AM  
**To:** Snyder, Erik ([snyder.erik@epa.gov](mailto:snyder.erik@epa.gov))  
**Cc:** McCorkle, Mark  
**Subject:** FW: EPA/ADEQ/Entergy Call

Erik,

FYI: Everyone is good with our conference call/meeting this Wednesday November 18 at 10am.  
Below are the attendees for Entergy.

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR. 72118

U.S.A.

Voice: 501 682-0070

Fax: 501 682-0753

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**From:** Triplett, David [<mailto:dttri1@entergy.com>]

**Sent:** Monday, November 16, 2015 8:31 AM

**To:** Clark, David

**Cc:** McCorkle, Mark; JOHNSON, GEORGE; [wood@gill-law.com](mailto:wood@gill-law.com); 'debra.jezouit@bakerbotts.com';  
Richard Hamel ([Richard.Hamel@erm.com](mailto:Richard.Hamel@erm.com))

**Subject:** RE: EPA/ADEQ/Entergy Call

Thanks David.

I have confirmed the attendees for Entergy for this meeting. They will be:

Myself

Tracy Johnson (Manager, Arkansas Environmental Support)

Rich Hamel (ERM)

Chad Wood (Gill Law Firm)

Debra Jezouit (Baker Botts)

Tracy, Chad, and I would like to attend in person at ADEQ. Rich and Debra will plan to call in with the information you provide below.

David Triplett, P.E.

Senior Lead Environmental Analyst

Air Lead, Arkansas Environmental Support

Entergy Services, Inc.

8-750-4030 (internal) | (501) 377-4030 (office) | (501) 650-1752 (cell)



**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]  
**Sent:** Friday, November 13, 2015 12:26 PM  
**To:** Triplett, David  
**Cc:** McCorkle, Mark  
**Subject:** RE: EPA/ADEQ/Entergy Call

David,

Erik Snyder is on board for 10am Wednesday November 18. We'll use this EPA call in number:

Ex. 6 - Personal Privacy

Conf. Code

Ex. 6 - Personal Privacy

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

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North Little Rock, AR. 72118

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**From:** Triplett, David [<mailto:dtrip11@entergy.com>]

**Sent:** Tuesday, November 10, 2015 5:08 PM

**To:** Clark, David

**Subject:** EPA/ADEQ/Entergy Call

David,

I wanted to get back to you and let you know that a call at 10 am on Wednesday November 18<sup>th</sup> works for us. I will get back with you on exactly who, besides myself, will be participating on this call for Entergy. It looks like Rich Hamel with ERM will also be able to join us.

I am going to put this down on my calendar as a confirmed date/time. Please let me know if anything changes.

David Triplett, P.E.

Senior Lead Environmental Analyst

Air Lead, Arkansas Environmental Support

Entergy Services, Inc.

8-750-4030 (internal) | (501) 377-4030 (office) | (501) 650-1752 (cell)



**To:** Clark, David[CLARKD@adeq.state.ar.us]  
**From:** Snyder, Erik  
**Sent:** Fri 11/13/2015 6:21:07 PM  
**Subject:** RE: EPA/ADEQ/Entergy 1-hour SO2 Sierra Club Modeling Conference Call

Hi David,

Some people are out today, but it looks like that time will work for us. We can use my #. It is 1-

Ex. 6 - Personal Privacy

Conf. Code

Ex. 6 - Personal Privacy

Thanks for helping to coordinate.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Clark, David [mailto:CLARKD@adeq.state.ar.us]  
**Sent:** Thursday, November 12, 2015 3:21 PM  
**To:** Snyder, Erik  
**Subject:** EPA/ADEQ/Entergy 1-hour SO2 Sierra Club Modeling Conference Call

Hello Erik,

Following up with you about a conference call on Wednesday November 18 to discuss Sierra Club's modeling of Entergy's Independence and White Bluff facilities. Does 10am work for your staff? Also, do you want to use an EPA call in number or I can provide an ADEQ call in number?

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

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U.S.A.

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**To:** vennetta.hayes@la.gov[vennetta.hayes@la.gov]; Vivian Aucoin[Vivian.Aucoin@LA.gov]  
**From:** Snyder, Erik  
**Sent:** Fri 10/16/2015 3:58:53 PM  
**Subject:** RE: Sierra Club 1-Hour SO2 modeling

Meant for Dolet Hills, not Independence and White Bluff. We also received modeling for Big Cajun from SC but we are not doing anything with that since it is not a CD source.

-Erik

**From:** Snyder, Erik  
**Sent:** Friday, October 16, 2015 8:38 AM  
**To:** vennetta.hayes@la.gov; Vivian Aucoin  
**Subject:** Sierra Club 1-Hour SO2 modeling

Hi Vennetta/Vivian,

Wanted to touch base on a couple of things related to 1-Hour SO2. First I wanted to confirm that you all had the Sierra Club modeling files for Independence and White Bluff. Let me know if you don't have it and we can figure a way to get to you.

We are currently reviewing all the modeling from industry, states, and SC currently. As we do our review we also wanted to reach out to our states. If you all were reviewing the SC modeling and if you have comments wanted to discuss with you sometime next week if you have time.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6

Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Mark McCorkle (MAC@adeq.state.ar.us)[MAC@adeq.state.ar.us]  
**From:** Snyder, Erik  
**Sent:** Fri 10/16/2015 1:37:37 PM  
**Subject:** Sierra Club 1-Hour SO2 modeling

Hi Mark,

Wanted to touch base on a couple of things related to 1-Hour SO2. First I wanted to confirm that you all had the Sierra Club modeling files for Independence and White Bluff. Let me know if you don't have it and we can figure a way to get to you.

We are currently reviewing all the modeling from industry, states, and SC currently. As we do our review we also wanted to reach out to our states. If you all were reviewing the SC modeling and if you have comments wanted to discuss with you sometime next week if you have time.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** vennetta.hayes@la.gov[vennetta.hayes@la.gov]; Vivian Aucoin[Vivian.Aucoin@LA.gov]  
**From:** Snyder, Erik  
**Sent:** Fri 10/16/2015 1:37:35 PM  
**Subject:** Sierra Club 1-Hour SO2 modeling

Hi Vennetta/Vivian,

Wanted to touch base on a couple of things related to 1-Hour SO2. First I wanted to confirm that you all had the Sierra Club modeling files for Independence and White Bluff. Let me know if you don't have it and we can figure a way to get to you.

We are currently reviewing all the modeling from industry, states, and SC currently. As we do our review we also wanted to reach out to our states. If you all were reviewing the SC modeling and if you have comments wanted to discuss with you sometime next week if you have time.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Daniel Menendez[daniel.menendez@tceq.texas.gov]  
**Cc:** Grady, James[Grady.James@epa.gov]  
**From:** Snyder, Erik  
**Sent:** Fri 9/25/2015 3:17:55 PM  
**Subject:** RE: modeling files for SO2

Thanks. I have downloaded Coletto Creek and it looked fine. I'll let you know if we have any problems with the others or have follow-up questions.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Daniel Menendez [mailto:daniel.menendez@tceq.texas.gov]  
**Sent:** Friday, September 25, 2015 9:48 AM  
**To:** Snyder, Erik  
**Cc:** Grady, James  
**Subject:** RE: modeling files for SO2

Hi Erik,

I am attaching the modeling files for Twin Oaks. As suggested, I have renamed the zip file with a .zzz extension. I will follow this email up with 2 additional emails containing the files for Coletto Creek and Tolk.

Please let me know if you have any problems opening the file or need additional information.

Thanks,

Daniel

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]  
**Sent:** Thursday, September 24, 2015 2:13 PM  
**To:** Daniel Menendez; Daniel Jamieson  
**Cc:** Grady, James  
**Subject:** modeling files for SO2

Hi Daniel,

You mentioned that it might be easiest to just email the files instead of the ftp account approach for the 1-hour SO2 recommendations. Can you send the files to me and James Grady. If you send zip files, please rename with a .zzz extension. Let me know if this won't work and we need to do the ftp route.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Ashford, Leon[Leon.Ashford@deq.ok.gov]  
**From:** Snyder, Erik  
**Sent:** Mon 9/21/2015 12:00:44 PM  
**Subject:** RE: Modeling files used for the basis of our 2010 SO2 NAAQS Consent Decree recommendation

I haven't talked with Eric yet, but both would be appreciated. DVD is fine.

Thanks,

Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Ashford, Leon [mailto:Leon.Ashford@deq.ok.gov]  
**Sent:** Friday, September 18, 2015 3:56 PM  
**To:** Snyder, Erik  
**Subject:** Modeling files used for the basis of our 2010 SO2 NAAQS Consent Decree recommendation

Erik,

Has Eric Milligan talked to you about the modeling files? Would you want the report, the modeling files, or both? The report can be attached to email, but the modeling files are about 870 meg zipped, so we have used a DVD to transfer them.

Thanks

Leon Ashford

Oklahoma DEQ

**To:** Daniel Menendez[daniel.menendez@tceq.texas.gov]  
**Cc:** Dominic Ruggeri[dom.ruggeri@tceq.texas.gov]; Ron Thomas[Ron.Thomas@tceq.texas.gov]  
**From:** Snyder, Erik  
**Sent:** Mon 8/24/2015 5:06:05 PM  
**Subject:** RE: Potential R6 Modeling workshop in Dallas in early November

I meant to include that we can have discussions earlier if we need too. Let me know.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Snyder, Erik  
**Sent:** Monday, August 24, 2015 10:33 AM  
**To:** 'Daniel Menendez'  
**Cc:** Dominic Ruggeri; Ron Thomas  
**Subject:** RE: Potential R6 Modeling workshop in Dallas in early November

Hi Daniel,

Appreciate the feedback. Not sure if we can do earlier due to timing and other commitments. The final DRR did provide some additional time for modeling and materials supporting monitor(s) locations. The only thing due January 16, 2016 is the list of sources and the final modeling and monitoring recommendations are due July 1<sup>st</sup> 2016 is my understanding. I know you all have internal review dates that would back up some from these dates. Do you have a revised timeline when you have to have the proposed sources for management review?

Give me a call if you have time and we can chat further.

-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**From:** Daniel Menendez [<mailto:daniel.menendez@tceq.texas.gov>]  
**Sent:** Monday, August 24, 2015 7:51 AM  
**To:** Snyder, Erik  
**Cc:** Dominic Ruggeri; Ron Thomas  
**Subject:** RE: Potential R6 Modeling workshop in Dallas in early November

Hello Erik,

We are glad to hear you are considering a Region 6 modelers meeting. It is something we are interested in and will begin the process to get travel approval once the dates have been confirmed.

That being said, we hope you can consider earlier dates for the meeting. With the short time frame requirements of the DRR, an earlier meeting would be beneficial so that we can incorporate any discussions during the meeting into our plan to evaluate the DRR sources. A meeting in November would not allow much time before the January deadline to identify the sources/areas to be evaluated.

Thanks,

Daniel

**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]

**Sent:** Wednesday, August 19, 2015 11:16 AM

**To:** Daniel Menendez; Daniel Jamieson; Dominic Ruggeri; Ron Thomas; Zarena Post; Jeff Stonesifer; Sufi Mustafa; Eric Peters; Gi-Dong; Eric Milligan; Lee Warden; Thomas Rheaume; [vennetta.hayes@la.gov](mailto:vennetta.hayes@la.gov); Tien Nguyen; Yvette Olmos; Jim Smith

**Cc:** Mohr, Ashley; Feldman, Michael; Robinson, Jeffrey; Donaldson, Guy

**Subject:** Potential R6 Modeling workshop in Dallas in early November

Hi,

We haven't had a Region 6 modelers workshop in Dallas in a while. With the final DRR and proposed changes in App. W, thought it might be a good time to have a meeting here in Dallas. I am not planning on discussing photochemical issues other than maybe secondary pollutant analysis for permits. The main focus would be modeling for the SO<sub>2</sub> sources as part of the SO<sub>2</sub> Phase 3 and 4 designations process (either modeling directly or modeling for monitor locations around a facility). We could also discuss other issues if there is interest. I was thinking some discussion on ozone and PM<sub>2.5</sub> impacts from single source for permitting might and what sources should be included in cumulative analysis are two topics that might also be beneficial. At this time I am targeting the first week in November (11/2-11/5) as possible date(s). Would only plan for 1 or two days within this period but we have locked meeting space for M-R currently. I think we will be able to get one or two people from OAQPS that week to come to Dallas (James Thurman and/or George Bridgers most likely). They are available for travel and this would be after the close of the proposed changes to App. W, so we could talk about any of the proposed changes.

Please let me know your interest and availability (if this week works and if M-T, T-W or W-R is best). Also any ideas for specific topics/issues.

Thanks,

Erik

Erik Snyder

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EPA Region 6  
Phone: 214-665-7305  
Fax: 214-665-7263  
email: [snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)

**To:** Peter, David[peter.david@epa.gov]; Hawkins, Andy[hawkins.andy@epa.gov]  
**Cc:** Bredehoft, Deborah[bredehoft.deborah@epa.gov]; Weber, Rebecca[Weber.Rebecca@epa.gov]; Jay, Michael[Jay.Michael@epa.gov]  
**From:** Douglas Watson  
**Sent:** Thur 1/12/2017 5:28:41 PM  
**Subject:** Kansas 1-hr SO2 DRR-Third Round designation submittal Document Package  
[Kansas 1-Hr SO2 DRR-Third Round Designation Submittal compressed.pdf](#)

All-

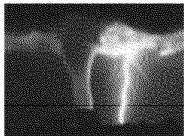
Please find attached the Kansas submission package for 1-hr SO2 DRR-Third Round Designation. A separate hard copy has been sent to the R7 Administrator. I will also attach the BPU updated modeling files to a separate e-mail. If you have any questions, please contact me. Thanks.

-Doug

\*\* Please note my new e-mail address – [Douglas.Watson@ks.gov](mailto:Douglas.Watson@ks.gov)

Douglas Watson  
Chief, Air Monitoring & Planning Section

Meteorologist  
Kansas Department of Health and Environment  
Bureau of Air  
1000 SW Jackson, Suite 310  
Topeka, KS 66612-1366  
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Fax: 785-368-6368  
www.kdheks.gov

Susan Mosier, MD, Secretary

Department of Health & Environment

Sam Brownback, Governor

January 10, 2017

Mark Hague, Regional Administrator  
USEPA Region 7  
11201 Renner Blvd  
Lenexa, KS 66219

Dear Mr. Hague:

This letter is being submitted to the Environmental Protection Agency (EPA) to recommend final area designations for the 1-hour National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO<sub>2</sub>) per the August 21, 2015 final Data Requirements Rule (DRR)<sup>1</sup>. In the EPA's "Round 3" memorandum<sup>2</sup> issued on July 22, 2016, states are required to submit new/updated modeling analyses on the basis of current available information by January 13, 2017, in order to help EPA make its Round 3 designations by December 31, 2017. The KDHE submits the following recommendations per this guidance:

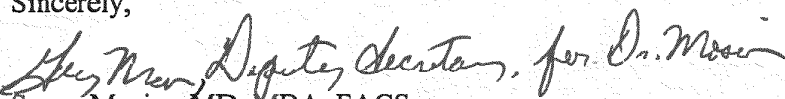
Unclassifiable/Attainment:  
Unclassifiable/Attainment:

Wyandotte County  
Shawnee County

The designation recommendations are based upon the Kansas Department of Health and Environment (KDHE) Bureau of Air analysis of monitoring data, dispersion modeling results, and proactive actions taken by the affected facilities. Based upon the factors specified in the DRR and related memoranda, the two Kansas facilities in question in the proposed area, Kansas City BPU - Nearman Creek Station and Westar Energy - Tecumseh Energy Center, do not significantly cause or contribute to violations of the Clean Air Act.

Feel free to contact Doug Watson, KDHE Bureau of Air Planning Section, at 785-296-0910 or [douglas.watson@ks.gov](mailto:douglas.watson@ks.gov), if you have any questions regarding these recommendations or the analyses upon which the recommendations are made.

Sincerely,

  
Susan Mosier, MD, MBA, FACS  
Secretary and State Health officer,  
Kansas Department of Health and Environment

Attachment:  
Technical Support Document and appendices

<sup>1</sup> <https://www.gpo.gov/fdsys/pkg/FR-2015-08-21/pdf/2015-20367.pdf>

<sup>2</sup> <https://www.epa.gov/sites/production/files/2016-07/documents/areadesign.pdf>

Kansas Department of Health and Environment  
Proposed “Round 3” Area Designations for the Environmental Protection Agency’s  
2010 Primary Sulfur Dioxide National Ambient Air Quality Standards  
Technical Support Document

**PURPOSE**

The purpose of this document is to present Kansas’ proposed recommendations for the State’s remaining area designations for the 2010 1-hour sulfur dioxide (SO<sub>2</sub>) National Ambient Air Quality Standard (NAAQS). This document deals with two counties: Shawnee County, which surrounds the Westar Energy - Tecumseh Energy Center (TEC); and Wyandotte County, which surrounds the Kansas City BPU - Nearman Creek Station (Nearman). In accordance with the August 21, 2015 final Data Requirements Rule (DRR)<sup>1</sup>, the Kansas City BPU has elected to characterize the air quality surrounding Nearman through air dispersion modeling, while Westar Energy has chosen the alternative approach of taking a federally enforceable limit of 2,000 tons of SO<sub>2</sub> per year for TEC.

The Kansas Department of Health and Environment (KDHE) will submit these recommendations to EPA Region 7 staff by January 13, 2017; EPA will make a final decision on designations for these areas by December 31, 2017 in its “Round 3” designations.<sup>2</sup> If EPA staff intend to modify the state’s recommendations or needs additional technical justification, they will notify KDHE 120 days prior to finalizing the designations.

**SUMMARY OF PROPOSED RECOMMENDATIONS**

KDHE is proposing to recommend unclassifiable/attainment status for each of the two counties in which the sources are located, i.e., Wyandotte County (for Nearman) and Shawnee County (for TEC).

**BACKGROUND**

On June 22, 2010, the EPA established a new 1-hour SO<sub>2</sub> primary NAAQS of 75 parts per billion (ppb), based on the three-year average of the annual 99th percentile of 1-hour daily maximum concentrations (75 FR 35520; June 22, 2010). This new SO<sub>2</sub> standard replaced the previous 24-hour and annual primary SO<sub>2</sub> NAAQS promulgated in 1971 (36 FR 8187; April 30, 1971). Once EPA establishes or revises a NAAQS, the Clean Air Act requires EPA to designate areas as “attainment” (meeting), “nonattainment” (not meeting), or “unclassifiable” (insufficient data).

The EPA has chosen a different approach to determine attainment status for the 1-hour SO<sub>2</sub> NAAQS. Unlike other criteria pollutants, SO<sub>2</sub> is almost exclusively a point source-emitted pollutant. A monitoring network large enough to adequately cover all large sources would be prohibitively expensive and an affordable network would leave large gaps in coverage. Therefore, EPA has decided to use a hybrid monitoring-modeling approach for the implementation of the 1-hour SO<sub>2</sub> standard.

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<sup>1</sup> <https://www.gpo.gov/fdsys/pkg/FR-2015-08-21/pdf/2015-20367.pdf>

<sup>2</sup> <https://www.epa.gov/sites/production/files/2016-07/documents/areadesign.pdf>

EPA is promulgating designations under this standard for areas throughout the nation in multiple phases. In the initial round, EPA designated areas as nonattainment based on 2010–2012 monitoring data from existing monitors showing a violation of the NAAQS. Kansas had no nonattainment areas; however, one of Missouri’s two designated nonattainment areas was in a portion of Jackson County, which lies directly east of Wyandotte County, Kansas on the Kansas-Missouri border. The Jackson County SIP and attainment demonstration was submitted to EPA on October 9, 2015, and Missouri’s subsequent rulemaking, *Control of Sulfur Dioxide Emissions* (10 CSR 10-6.261), which establishes federally enforceable limits on major SO<sub>2</sub> sources in the Kansas City area, comes into effect January 1, 2017.

As stated in §51.1202 in the DRR, sources that emitted more than 2,000 tons of SO<sub>2</sub> in the most recent, quality assured emission year (2014), excluding sources in previously designated nonattainment areas, must be evaluated under the DRR. The DRR details two characterization options available to sources: modeling or monitoring. Alternatively, a source may elect to adopt federally enforceable emissions limitations to less than 2,000 tons by January 13, 2017 to forego characterization under the DRR.

In September 2015, KDHE submitted a list of three sources affected by the DRR (and March 2014 Sierra Club consent decree<sup>3</sup>) around which to characterize air quality to fulfill the requirement outlined in §51.1203(a). These sources were the two power plants already mentioned (Nearman and TEC), as well as KCP&L - La Cygne (La Cygne). In EPA’s June 30, 2016 letter to Kansas Governor Brownback, EPA notified the State that the area surrounding La Cygne (Linn County) was designated unclassifiable/attainment. On the other hand, EPA designated Shawnee and Wyandotte counties unclassifiable, which necessitates a new round (i.e., this round) of designations under the DRR.

The following text outlines the technical analyses for the two facilities still requiring attainment demonstrations. Each facility is considerably different and will be addressed separately.

### **Kansas City BPU - Nearman**

#### *Purpose for designation determination:*

Nearman Creek Power Station (“Nearman”) was identified by the EPA for emitting 0.58 lb SO<sub>2</sub>/MMBtu in 2012, which exceeds the limit of average SO<sub>2</sub> emissions rate 0.45 lb SO<sub>2</sub>/MMBtu as specified in the Sierra Club consent decree.

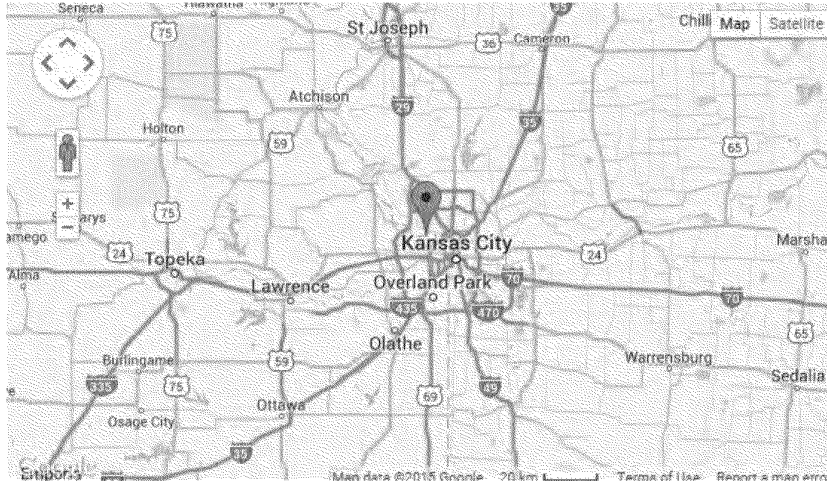
#### *Description of location and surrounding topography:*

Nearman is located in Wyandotte County, Kansas, in a relatively unpopulated area directly adjacent to the Missouri River. The topography is very flat as would be expected of a region in a river basin.

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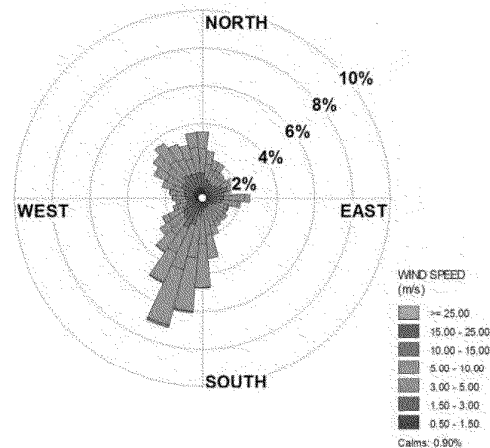
3

<http://content.sierraclub.org/environmentallaw/sites/content.sierraclub.org/environmentallaw/files/SO2%20Consent%20Decree.pdf>



#### *Regional meteorology:*

The wind rose plot (below) shows the wind frequencies from the closest representative meteorological station, the Downtown Kansas City (Charles Wheeler) Airport for years 2012–2014. Based upon the data it can be concluded that the wind primarily originates from the south-southwest, with a secondary component from the northwest.



#### *Justification for proposed designation:*

The Kansas City Board of Public Utilities (BPU) has taken the following steps to reduce SO<sub>2</sub> emissions from the Nearman plant in the recent years.

- Obtained a construction approval to restrict ultra-low diesel fuel oil sulfur content to 15 ppb for the simple cycle turbine at the Nearman facility on July 9, 2015.
- Obtained a construction permit that restricts operation of the Nearman Auxiliary Boiler to a 10% annual capacity factor, through a restriction on total annual amount of fuel oil burned. The compliance period for this restriction began January 31,

2016.

- Under a construction permit issued by KDHE August 5, 2013, and addendum issued September 11, 2015, BPU completed construction on the following emission controls on Nearman Unit 1 in November 2016:
  - Selective catalytic reduction system for NO<sub>x</sub> removal;
  - Powdered activated carbon injection system for mercury removal;
  - Circulating dry scrubber for SO<sub>2</sub> and acid gas removal; and
  - Pulse-jet fabric filter for particulate removal.

Trinity Consultants, Inc., was contracted to conduct modeling to characterize the 1-hour SO<sub>2</sub> rates for the facility. The modeling included nearby facilities emitting SO<sub>2</sub> located in Kansas City, Missouri. Missouri DNR is in the final stages of implementing rules to reduce SO<sub>2</sub> emissions from sources in Kansas City, Missouri through a rulemaking developed for a first-round SO<sub>2</sub> nonattainment designation. The most recent update of the Missouri Air Conservation Commission's Rules in Progress for the Missouri Department of Natural Resources (DNR) indicates the SO<sub>2</sub> control rule (10 CSR 10-6.261 Control of Sulfur Dioxide Emission<sup>4</sup>) will take effect on January 1, 2017. Using the allowable rates contained in the MDNR SO<sub>2</sub> control rule for nearby sources on the Missouri side and the actual rates from Nearman Unit 1, the highest concentration of modeled SO<sub>2</sub> results was 129 µg/m<sup>3</sup> (49 ppb). All modeling protocols and results for this source are provided in Appendix A and Appendix B.

***KDHE recommends that Wyandotte County, in which Nearman resides, be designated as unclassifiable/attainment.***

### **Westar Energy - Tecumseh**

#### *Purpose for designation determination:*

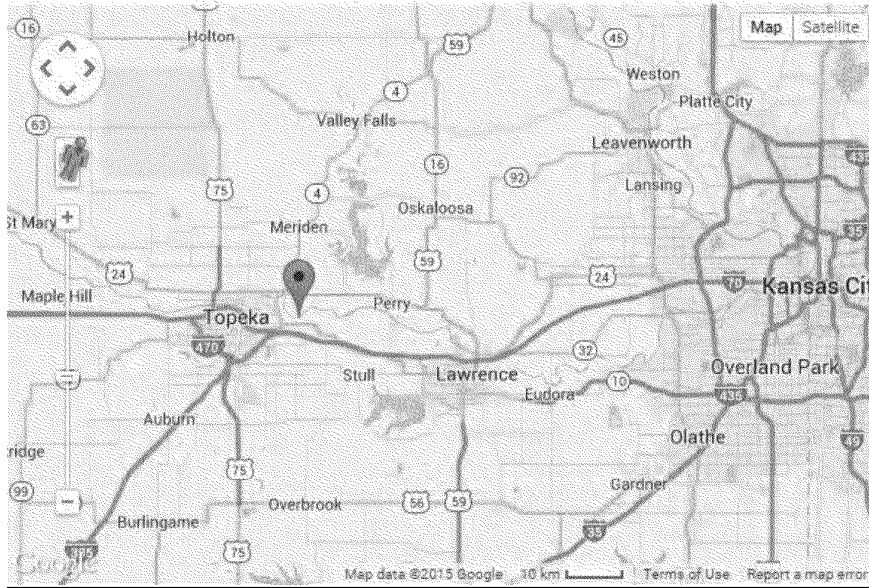
Westar Energy's Tecumseh Energy Center (TEC) was identified by the EPA for emitting 0.64 lb SO<sub>2</sub>/MMBtu in 2012, which exceeds the limit of average SO<sub>2</sub> emissions rate 0.45 lb SO<sub>2</sub>/MMBtu as specified in the consent decree.

#### *Description of location and surrounding topography:*

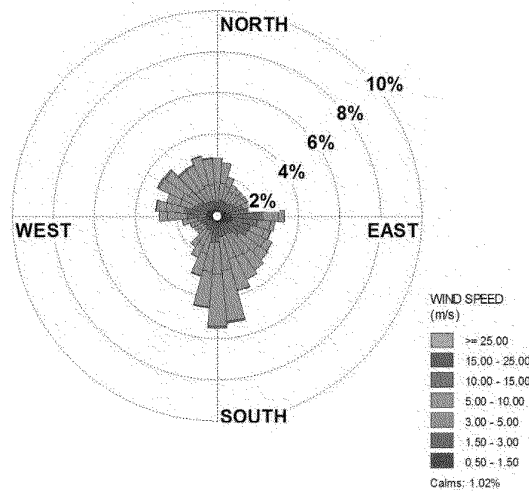
TEC is located east of Topeka, Kansas, in an unincorporated community, Tecumseh. The Tecumseh facility is sited directly south of the Kansas River. The topography is very flat as would be expected of a river basin.

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<sup>4</sup> <http://s1.sos.mo.gov/cmsimages/adrules/csr/current/10csr/10c10-6b.pdf>



The wind rose plot shows the wind frequencies from the closest representative meteorological station, the Topeka Municipal Airport, for years 2012–2014. The frequencies in the wind rose represent the direction in which the wind is coming from. Based upon the data it can be concluded that the wind primarily originates from the south, with a secondary maximum from the northwest.



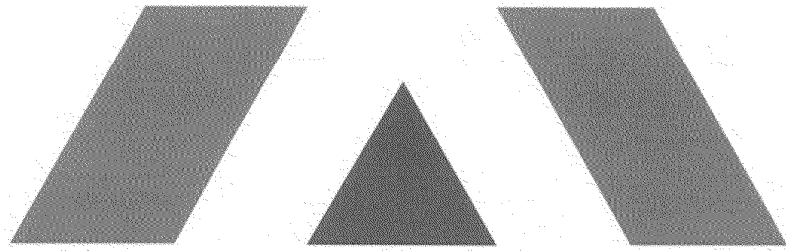
*Justification for proposed designation:*

Near the close of 2015, Westar Energy management consolidated operations at several of their electric generating facilities, and announced the retirement of three generating units, two of which were coal-fired boilers: the 61 MW Unit 3 at their Lawrence Energy Center in Lawrence, Kansas, and the 176 MW Unit 8/10 at TEC. The retirements were effective December 31, 2015.

The remaining 96 MW Unit 7/9 at TEC has not emitted over 2,000 tons of SO<sub>2</sub> for more than 10 years, with its latest available emission of SO<sub>2</sub> (in 2015) at 1,246 tons. Consequently, Westar Energy has decided to take a federally enforceable 2,000 tons per year limit, based on a 12-month rolling average. A copy of the construction permit, which memorializes this limit and was issued on November 21, 2016, is found in Appendix C.

***KDHE recommends that Shawnee County, in which TEC resides, be designated as unclassifiable/attainment.***

# APPENDIX A



## AIR DISPERSION MODELING REPORT FOR 1-HOUR SO<sub>2</sub> NAAQS DESIGNATION

Kansas City Board of Public Utilities  
Nearman Creek Station  
Kansas City, KS



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March 2016

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## 1. INTRODUCTION

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On approximately February 16, 2016, the EPA sent a letter to each state governor summarizing the EPA's proposed designation with respect to the 1-hour SO<sub>2</sub> NAAQS for areas impacted by the Consent Decree entered on March 2, 2015 in the U.S. District Court for the Northern District of California, and comparing the EPA's proposed designation to the state's recommendation designation. On March 3, 2016, the EPA published a notice of their proposed 1-hour SO<sub>2</sub> designations and related Technical Support Document (TSD) for each state and initiated a public comment period.

The area surrounding the Kansas City Board of Public Utilities (BPU's) Nearman Creek Station, which is located in Wyandotte County, Kansas, is one of the areas that is affected by the EPA's currently proposed designations. For this area, the EPA reviewed modeling submitted by both KDHE and Sierra Club and proposed a designation of unclassifiable. Along with their proposed designation, the EPA also suggested that the extent of the area of analysis (i.e. receptor grid) that was used in the modeling analysis that KDHE submitted was inconsistent with the modeling TAD. Specifically, EPA said *"since there were no receptors placed in Missouri, the receptor grid is inconsistent with the Modeling TAD, as receptors should be placed in areas where it would be feasible to place a monitor and record ambient impacts"*.

In August 2015, Trinity conducted dispersion modeling to determine the 1-hour SO<sub>2</sub> concentrations in the area surrounding Nearman Creek Station. The locations where modeled impacts were determined were limited to locations in Wyandotte County. BPU provided the modeling to KDHE. KDHE relied upon Trinity's dispersion modeling in their recommendation letter to EPA dated September 9, 2015. Thus, all references by EPA to KDHE's modeling are really references to Trinity's modeling.

Trinity has prepared an updated dispersion modeling analysis that provides additional information in the area surrounding Nearman Creek Station. The major change in the modeling from what was prepared in August 2015 is the extent of the area of analysis. The extent was revised from including Wyandotte County only to including an area that is 100 km by 100 km centered on Nearman Creek Station. Additional relevant changes include removing the Nearmand Creek Station N1 stack from being included as a structure in the BPIP analysis, modeling different emission rates for some sources, and including Independence Power & Light's Blue Valley units.

## 2. 1-HOUR SO<sub>2</sub> DESIGNATION MODELING - DATA AND PROCEDURES

### 2.1. MODELING OVERVIEW

Trinity performed 1-hour SO<sub>2</sub> modeling using AERMOD version 15181 along with Trinity's *BREEZE™* AERMOD software. All regulatory default options were used in the modeling. The pollutant ID was set to SO<sub>2</sub> and the output options were configured such that the model predicted an SO<sub>2</sub> design value based on the 3-year average of the 99<sup>th</sup> percentile of the annual distribution of the daily maximum 1-hour concentrations for comparison with the 1-hour SO<sub>2</sub> NAAQS of 196 ug/m<sup>3</sup>.

Modeling was conducted using the urban area option feature of AERMOD. Modeling performed recently by the Missouri Department of Natural Resources (MDNR) as part of the State Implementation Plan for compliance with the 2010 1-hour SO<sub>2</sub> NAAQS for the Jackson County nonattainment area, which included BPU's Nearman Creek Station facility, utilized the urban option for Kansas City. Urban/rural determinations were made by implementing both land-use and population density procedures and the area was found to be largely urban. Following guidance in 40 CFR Part 51, Appendix W, subsection 7.2.3(f), each source was modeled under the urban option. Trinity has elected to maintain the urban area option, following MDNR's evaluation of the same area for recent modeling. A population of 2,343,000 for the Kansas City metro area was used as the estimated total for the two state metropolitan region.

### 2.2. METEOROLOGICAL DATA

Trinity processed surface meteorological data for 2012, 2013, and 2014 collected at the Charles B. Wheeler Downtown Airport in Kansas City, Missouri. Upper air meteorological data was collected for the same years at nearest U.S. National Weather Service (NWS) upper-air balloon station, located in Topeka, Kansas (TOP). A determination of whether the surface meteorological data from the Charles B. Wheeler Downtown Airport were appropriate for use in BPU's modeling analyses was considered by determining whether the data were representative of the site where the Nearman Creek Station plant is located. The extremely close proximity of the airport with respect to Nearman Creek Station (approximately 6 miles), in addition to the similarity in the climatology and topography (the airport is approximately 758 feet and Nearman Creek Station is approximately 753 feet) support that the meteorological conditions at the airport are representative of the meteorological conditions at Nearman Creek Station.

AERMOD-ready meteorological data was prepared using the latest version of the U.S. EPA's AERMET meteorological processing utility (version 14134). Standard U.S. EPA meteorological data processing guidance was used as outlined in a recent memorandum<sup>1</sup> and other documentation.

#### 2.2.1. Surface Data

Raw hourly surface meteorological data was obtained from the U.S. National Climatic Data Center (NCDC) for Charles B. Wheeler Downtown Airport in Kansas City, Missouri (KMKC, WMO ID: 724463) in the standard ISHD format. This data was supplemented with TD-6405 (so-called "1-minute") wind data from KMKC. The 1-minute wind data was processed using the latest version of the U.S. EPA AERMINUTE pre-processing tool (version 14337). The quality of the 1-minute data was verified by comparison to the hourly ISHD data from KMKC. The

<sup>1</sup> Fox, Tyler, U.S. Environmental Protection Agency. 2013. "Use of ASOS Meteorological Data in AERMOD Dispersion Modeling." Available Online: [http://www.epa.gov/ttn/scram/guidance/clarification/20130308\\_Met\\_Data\\_Clarification.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/20130308_Met_Data_Clarification.pdf)

"Ice-Free Winds Group" AERMINUTE option was selected due to the fact that a sonic anemometer has been used at KMKC since 2006.

### 2.2.2. Upper Air Data

In addition to surface meteorological data, AERMET requires the use of data from a sunrise-time upper air sounding to estimate daytime mixing heights. Upper air data from the nearest U.S. National Weather Service (NWS) upper-air balloon station, located in Topeka, KS (TOP), was obtained from the National Oceanic and Atmospheric Administration (NOAA) in FSL format.

### 2.2.3. Land Use Analysis

Parameters derived from analysis of land use data (surface roughness, Bowen ratio, and albedo) are also required by AERMET. In accordance with U.S. EPA guidance, these values were determined using the latest version of the U.S. EPA AERSURFACE tool (version 13016).<sup>2</sup> The AERSURFACE settings that were used for processing are summarized in Table 2.1 below. The met station coordinates were determined by visually identifying the met station using Google Earth. NLCD 1992 (CONUS) Land Cover data used in AERSURFACE processing was obtained from the Multi-Resolution Land Use Consortium (MRLC).

U.S. EPA guidance dictates that on at least an annual basis, precipitation at a surface site should be classified as wet, dry, or average in comparison to the 30-year climatological record at the site. This determination is used to adjust the Bowen ratio estimated by AERSURFACE. To make the determination, annual precipitation in each modeled year (2012-2014) was compared to the 1981-2010 climatological record for KMKC.<sup>3</sup> The 30<sup>th</sup> and 70<sup>th</sup> percentile values of the annual precipitation distribution from the most recent available 30-year period was calculated. Per U.S. EPA guidance, each modeled year was classified for AERSURFACE processing as "wet" if its annual precipitation was higher than the 70<sup>th</sup> percentile value, "dry" if its annual precipitation was lower than the 30<sup>th</sup> percentile value, and "average" if it was between the 30<sup>th</sup> and 70<sup>th</sup> percentile values.

**Table 2-1. AERSURFACE Input Parameters**

<b>AERSURFACE Parameter</b>	<b>Value</b>
Met Station Latitude	39.120963
Met Station Longitude	-94.597027
Datum	NAD 1983
Radius for surface roughness (km)	1.0
Vary by Sector?	Yes
Number of Sectors	12
Temporal Resolution	Seasonal
Continuous Winter Snow Cover?	No
Station Located at Airport?	Yes
Arid Region?	No
Surface Moisture Classification	Determined based on 30 <sup>th</sup> and 70 <sup>th</sup> percentile of climate normals

<sup>2</sup> U.S. Environmental Protection Agency. 2013. "AERSURFACE User's Guide." EPA-454/B-08-001, Revised 01/16/2013. Available Online: [http://www.epa.gov/scram001/7thconf/aermod/aersurface\\_userguide.pdf](http://www.epa.gov/scram001/7thconf/aermod/aersurface_userguide.pdf)

<sup>3</sup> National Climatic Data Center. 2010 Local Climatological Data (LCD), Charles B. Wheeler Airport (KMKC).

## 2.2.4. AERMET Processing Options

Standard AERMET processing options were used.<sup>4,5</sup> The options elected included the following:

- MODIFY keyword for upper air data
- THRESH\_1MIN 0.5 keyword to provide a lower bound of 0.5 m/s for 1-minute wind data
- AUDIT keywords to provide additional QA/QC and diagnostic information
- ASOS1MIN keyword to incorporate 1-minute wind data
- NWS\_HGT WIND 10 keyword to designate the anemometer height as 7.9 meters
- METHOD WIND\_DIR RANDOM keyword to correct for any wind direction rounding in the raw ISHD data
- METHOD REFLEVEL SUBNWS keyword to allow use of airport surface station data
- Default substitution options for cloud cover and temperature data were not overridden
- Default ASOS\_ADJ option for correction of truncated wind speeds was not overridden
- ADJ\_U\* beta option was not used

## 2.3. COORDINATE SYSTEM

In all modeling input and output files, the locations of emission sources, structures, and receptors were represented in Zone 15 of the Universal Transverse Mercator (UTM) coordinate system using datum World Geodetic System (WGS) 1984, which is comparable to the North American Datum 1983 (NAD83). Nearman Creek Station is approximately centered at UTM, Zone 15, coordinates 353,394 meters East and 4,337,135 meters North. The base elevation of the facility is approximately 230 meters above mean sea level.

## 2.4. RECEPTOR LOCATIONS

The model included a receptor grid centered on Nearman Creek Station that expanded 50 km in each direction, for a total grid of 100 km by 100 km. The grid included the following receptor spacing centered on Nearman Creek Station:

- 100 meter spacing from 0 to 5 km
- 1,000 meter spacing from 5 to 25 km
- 5,000 meter spacing from 25 to 50 km

A receptor was also placed at the location of the SO<sub>2</sub> "Troost monitor" in Missouri. Figure 2.1 shows a map of the receptor locations with respect to Nearman Creek Station.

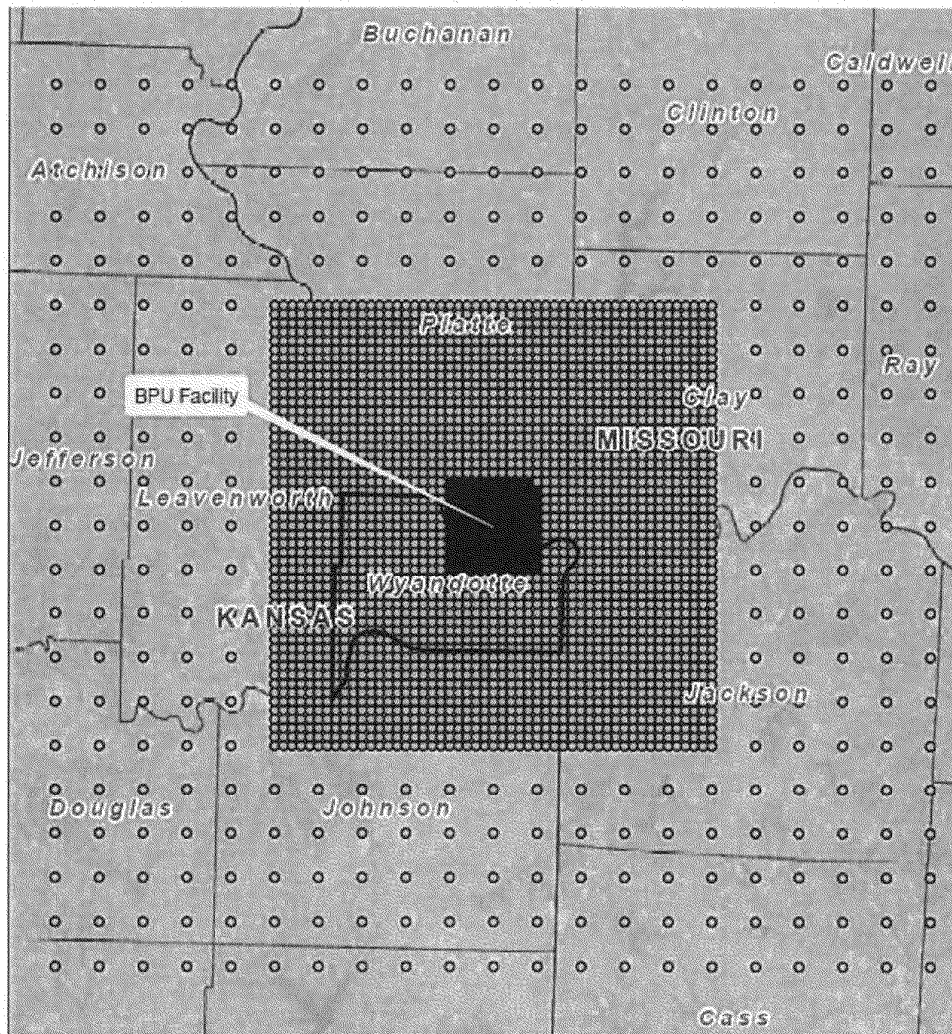
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<sup>4</sup> Fox, Tyler, U.S. Environmental Protection Agency. 2013. "Use of ASOS Meteorological Data in AERMOD Dispersion Modeling." Available Online:

[http://www.epa.gov/ttn/scram/guidance/clarification/20130308\\_Met\\_Data\\_Clarification.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/20130308_Met_Data_Clarification.pdf)

<sup>5</sup> U.S. Environmental Protection Agency. 2014. "User's Guide for the AERMOD Meteorological Preprocessor (AERMET)". EPA-454/B-03-002, November 2004).

Figure 2-1. Map of Receptor Grid



## 2.5. TERRAIN ELEVATIONS

The terrain elevation for each receptor, building, and emission source was determined using USGS 1/3 arc-second National Elevation Data (NED). The NED, obtained from the USGS, has terrain elevations at 10-meter intervals. Using the AERMOD terrain processor, AERMAP (version 11103), the terrain height for each receptor, building, and emission source included in the model was determined by assigning the interpolated height from the digital terrain elevations surrounding each source.

In addition, AERMAP was used to compute the hill height scales for each receptor. AERMAP searches all NED points for the terrain height and location that has the greatest influence on each receptor to determine the hill

height scale for that receptor. AERMOD then uses the hill height scale in order to select the correct critical dividing streamline and concentration algorithm for each receptor.

## 2.6. EMISSION SOURCES

### 2.6.1. Wyandotte County Emission Sources

The boiler at Nearman Creek Station is currently the only significant source of SO<sub>2</sub> in Wyandotte County. Thus, this is the only source located in Wyandotte County that was included in the model. The stack for the boiler was modeled as a point source. The emission rates and stack parameters that were used to characterize the boiler are summarized in Table 2-2 below.

Table 2-2. Nearman Creek Station Model Inputs

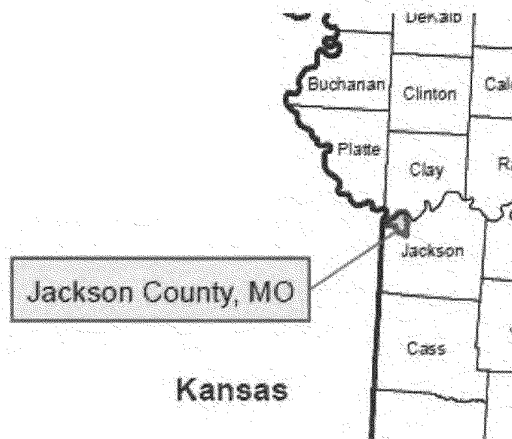
X Coordinate (m) <sup>1</sup>	Y Coordinate (m) <sup>1</sup>	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (ft/s)	Flow Rate (acfm)	Exit Temp (F)	Emission Rate (lb/hr)
353394.7	4337135.7	400	20	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS

<sup>1</sup>UTM Zone 15, NAD 83

### 2.6.2. Jackson County Sources

Portions of Jackson County were designated nonattainment for 1-hour SO<sub>2</sub> during Phase 1 of the designations under the EPA's Data Requirements Rule. Figure 2-2 shows the Jackson County nonattainment area.

Figure 2-2 Jackson County, Missouri 1-Hour SO<sub>2</sub> Nonattainment Area<sup>1</sup>



<sup>1</sup>From EPA's Green Book.

The 100 km X 100 km grid centered on Nearman Creek Station includes sources in the nonattainment area. The MDNR developed a nonattainment SIP that addresses the nonattainment area. The SIP includes limits that result in modeled compliance with the NAAQS for several large sources within and near the nonattainment area.

Some of the limits contained in the SIP are higher than 2012 to 2014 actual emissions, as is the case for the Missouri City Independence Power & Light boilers 1 & 2 stack (EP5) and heating boiler stack (EP6). On the contrary, some of the SIP limits are less than 2012 to 2014 actual emissions, but higher than emissions occurring since the Boiler MACT compliance date of January 31, 2016, which is the case for Veolia Energy in Kansas City, Missouri. In 2015, Veolia switched to burning natural gas instead of coal in order to comply with the Boiler MACT. While Veolia is burning natural gas, BPU recognizes that there is no permit condition restricting Veolia from burning coal, and thus a coal restriction is not a federally enforceable requirement. However BPU also recognizes that Veolia could only start burning coal if emission controls were put in place that would allow the boilers to meet the emission limits in the Boiler MACT. Veolia has modified its existing Title V operating permit to remove all references to coal, and it is reasonable to estimate actual emissions from the Boiler MACT compliance data of January 31, 2016 and forward based on the use of natural gas.

The fuel changes made by Veolia in 2015, along with other changes in the area, resulted in large reductions in SO<sub>2</sub> concentrations in the Jackson County nonattainment area. In 2016, the 99<sup>th</sup> percentile 1-hour SO<sub>2</sub> concentration measured at the Troost monitor in Kansas City, Missouri is only 7 ppb, well below the NAAQS of 75 ppb and a large drop from previous years. This is evidence that recent changes are making a significant difference on SO<sub>2</sub> concentrations in the nonattainment area. Since a fuel change was implemented at Veolia in 2015, and the TAD suggests that actual emissions should be modeled, it is likely most appropriate to model emissions from Veolia reflective of natural gas combustion. In short, Trinity has relied upon the SO<sub>2</sub> limits in the MDNR's nonattainment SIP for Veolia, which are higher than the current actual emissions from Veolia, as a conservative approach for handling emissions from Veolia.

For purposes of the modeling, for sources without CEMS data, 2013 actual emissions were modeled except for the case of Veolia where SIP limits were modeled (MDNR's SIP limits will be federally enforceable as of January 1, 2017, six months after designations for Phase 2 will be complete). This is a conservative estimate of actual emissions since Veolia has already reduced emissions to comply with the Boiler MACT. Other Jackson County sources were modeled using three years (2012-2014) of CEMS data where CEMS was available.

Table 2-3 below summarizes the sources in Jackson County, Missouri that were included in the model.

Table 2-3. Jackson County Source Model Inputs<sup>1</sup>

Facility & Unit	X Coordinate (m) <sup>2</sup>	Y Coordinate (m) <sup>2</sup>	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (ft/s)	Flow Rate (acfm)	Exit Temp (F)	Emission Rate (lb/hr)
Independence Power & Light at Missouri City, Boilers 1 & 2 Stack (EP5)	4343248.6	387072.9	300	10.5	23.0	119,494.4	290	220.4
Independence Power & Light at Missouri City, Heating Boiler Stack (EP6)	4343248.6	387072.9	93	1.67	20.0	2,628.5	405	0.1
Independence Power & Light at Blue Valley, Unit 1 (EP3)	4327808.3	385311.9	153	5.5	47.1	67,104.9	323	193.4
Independence Power & Light at Blue Valley, Unit 2 (EP4)	4327821.1	385313.6	153	5.5	51.8	73,840.8	356	224.6
Independence Power & Light at Blue Valley, Unit 3 (EP5)	4327832.3	385329.9	250	6.75	97.86	210,113.5	320	340.3
Veolia Energy, Boiler 1A Stack (EP1)	4330417	363390.1	156	7.0	47.9	110,604.5	600	0.50
Veolia Energy, Boilers 6 & 8 Stack (EP2)	4330434.0	363376.5	282	16.75	5.96	78,798.3	253	351.8
Veolia Energy, Boiler 7 Stack (EP3)	4330428	363422.9	282	16.75	5.02	66,370.4	282	0.50
KCP&L GMO at Sibley, EP5A Stack	4337276.5	397714.9	696	13.5	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS
KCP&L GMO at Sibley, EP5B Stack	4337276.5	397714.9	696	13.5	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS
KCP&L GMO at Sibley, EP5C Stack	4337276.5	397714.9	696	13.5	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS
KCP&L at Hawthorn, Unit 6/9 Stack (EP901)	4332321.2	372276.7	602	20.34	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS	2012-2014 CEMS

<sup>1</sup> Provided in a May 26, 2015 e-mail from Lynn Deahl of KDHE to BPU.

<sup>2</sup> UTM Zone 15, NAD 83.

## 2.7. BUILDING INFLUENCES

The U.S. EPA's Building Profile Input Program (BPIP) with Plume Rise Model Enhancements (PRIME) (version 04274), was used to account for building downwash influences in the model. The purpose of a building downwash analysis is to determine if the plume discharged from a stack will become caught in the turbulent wake of a building (or other structure), resulting in downwash of the plume. The downwash of the plume can result in elevated ground-level concentrations.

Note, initial modeling included a building and stack structure for the stack. The updated modeling, however, removed the building structure and just left the stack as a point source. BPIP was re-run prior to running the updated modeling.

## 2.8. BACKGROUND CONCENTRATION

KDHE requested that BPU use a 1-hour SO<sub>2</sub> background concentration of 13 parts per billion (ppb), or 33.57 µg/m<sup>3</sup>, which KDHE feels was representative of the background concentration in the vicinity of Nearman Creek Station. BPU incorporated the agreed upon background concentration in the model.

### 3. RESULTS

Table 3-1 lists the maximum modeled concentration from each source individually, the Missouri sources combined, and all sources combined. As Table 3-1 shows, each individual source, including BPU's Nearman N1, as well as the total combined sources do not exceed the 1-hour SO<sub>2</sub> NAAQS of 196 µg/m<sup>3</sup> at any receptor.

**Table 3-1. Modeled Results from Updated Modeling**

Source	Modeled Emission Rate (lb/hr)	Highest Concentration <sup>1</sup> (µg/m <sup>3</sup> )	Exceed NAAQS? <sup>2</sup>
BPU - Nearman N1	3 Year CEMS	129	NO
Veolia Energy - EP1	0.5	0	NO
Veolia Energy - EP2	351.8	81	NO
Veolia Energy - EP3	0.5	0	NO
Independence Power & Light - Missouri City EP5	220.4	27	NO
Independence Power & Light - Missouri City EP6	0.1	0	NO
KCP&L GMO - Sibley EP5A	3 Year CEMS	9	NO
KCP&L GMO - Sibley EP5B	3 Year CEMS	11	NO
KCP&L GMO - Sibley EP5C	3 Year CEMS	63	NO
KCP&L - Hawthorn EP6	3 Year CEMS	27	NO
Independence Power & Light - Blue Valley EP3	193.40	25	NO
Independence Power & Light - Blue Valley EP4	224.60	26	NO
Independence Power & Light - Blue Valley EP5	340.30	26	NO
Missouri Sources	--	83	NO
Combined Sources	--	129	NO

<sup>1</sup>Background concentration = 33.57 µg/m<sup>3</sup> and is not added in here.

<sup>2</sup>NAAQS for 1-Hour SO<sub>2</sub> = 196 µg/m<sup>3</sup>.

Figures 3-1 and 3-2 below show the modeled concentrations from all of the sources. As Figure 3-1 shows, the highest concentrations from all of the sources occur about 2 to 3 kilometers southeast of Nearman Creek Station. Figure 3-2 shows there are also hot spots of higher concentrations in portions of Jackson and Ray Counties near some of the other modeled sources. While pockets of higher concentrations exist both near Nearman Creek Station and in portions of Jackson and Ray Counties, all concentrations are below the NAAQS.

Figure 3-1. Modeled Concentrations from Combined Sources (Zoomed View)

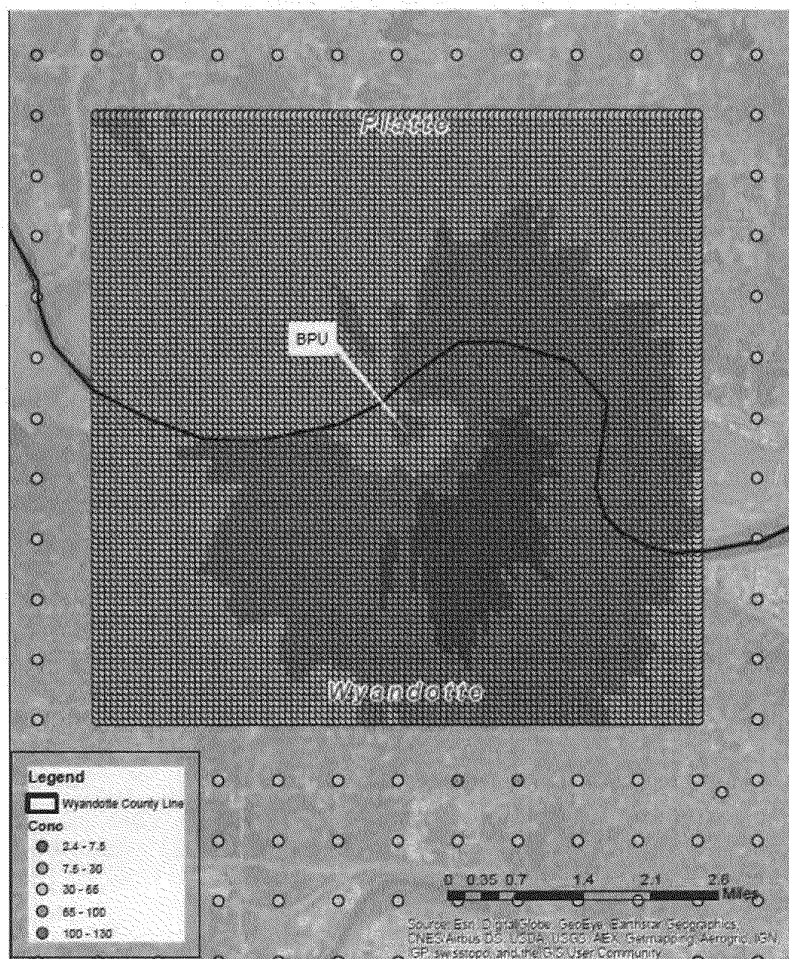
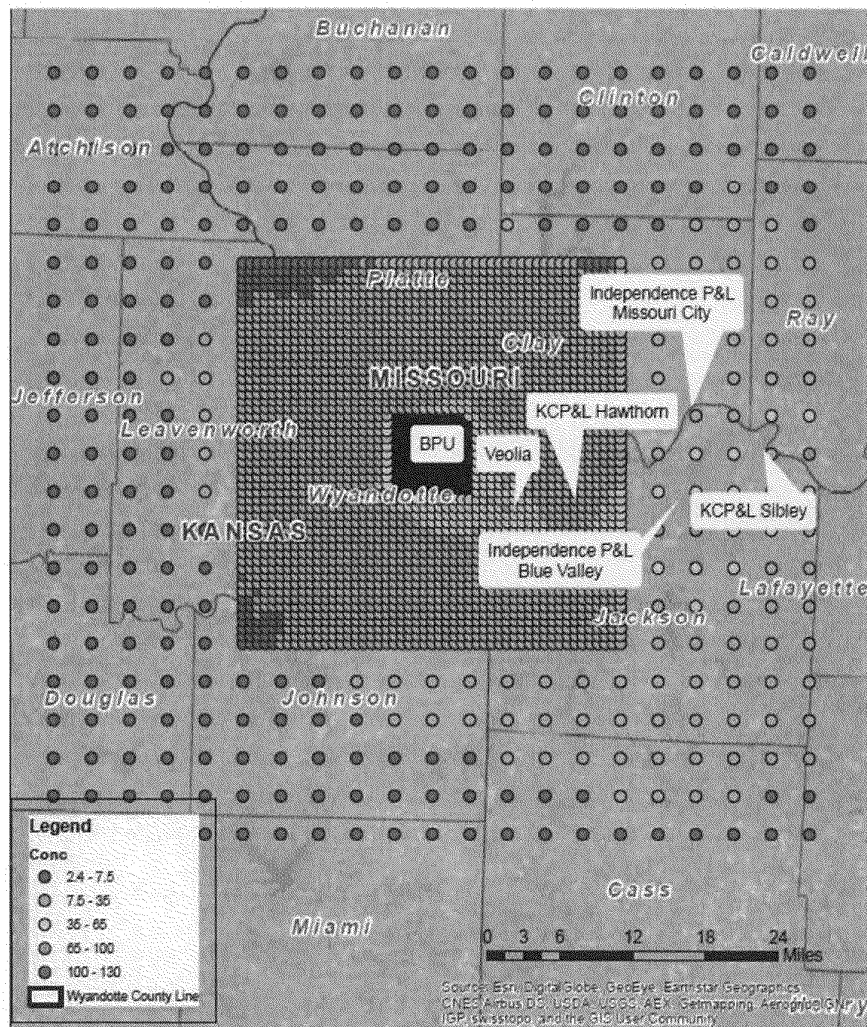


Figure 3-2. Modeled Concentrations from Combined Sources (Wide View)



Based on the above analysis, it can be concluded that BPU alone does not cause OR contribute to any violation of the NAAQS anywhere within the modeling domain since concentrations from BPU alone, and concentrations from BPU combined with all other sources are all below the NAAQS.

# APPENDIX B

**Updated Attainment Modeling Results**

<b>Source</b>	<b>Modeled Emission Rate (lb/hr)</b>	<b>Highest Concentration<sup>1</sup> (µg/m<sup>3</sup>)</b>	<b>Exceed NAAQS?<sup>2</sup></b>
BPU - Nearman N1	3 Year CEMS	129	NO
Veolia Energy - EP1	0.5	0	NO
Veolia Energy - EP2	351.8	81	NO
Veolia Energy - EP3	0.5	0	NO
Independence Power & Light - Missouri City EP5	220.4	27	NO
Independence Power & Light - Missouri City EP6	0.1	0	NO
KCP&L GMO - Sibley EP5A	3 Year CEMS	9	NO
KCP&L GMO - Sibley EP5B	3 Year CEMS	11	NO
KCP&L GMO - Sibley EP5C	3 Year CEMS	63	NO
KCP&L - Hawthorn EP6	3 Year CEMS	27	NO
Independence Power & Light - Blue Valley EP3	193.40	25	NO
Independence Power & Light - Blue Valley EP4	224.60	26	NO
Independence Power & Light - Blue Valley EP5	340.30	26	NO
Missouri Sources	--	83	NO
Combined Sources	--	129	NO

<sup>1</sup>Background concentration = 33.57 ug/m<sup>3</sup> and is not added in here.

<sup>2</sup>NAAQS for 1-Hour SO<sub>2</sub> = 196 ug/m<sup>3</sup>.

# APPENDIX C

Susan Mosier, MD, Secretary

Department of Health & Environment

Sam Brownback, Governor

January 9, 2017

Source ID No. 1770030

Ms. Stephanie Hirner  
Supervisor, Air Permitting and Compliance  
Westar Energy  
P.O. Box 889  
Topeka, Kansas 66601

Re: Air Emission Source Construction Permit for Westar Energy, Inc., Tecumseh Energy Center

Dear Ms. Hirner:

The Kansas Department of Health and Environment (KDHE) has reviewed Westar Energy, Inc.'s application proposing to accept a federally enforceable emission limitation on emission unit Combustion Engineering Boiler identified as EU-BLR7/9 at Tecumseh Energy Center to comply with the EPA's sulfur dioxide Data Requirements Rule (DRR).

**Please review the permit carefully since it obligates Westar Energy, Inc. to certain requirements.**

Currently, Westar Energy, Inc. operates under a Class I Air Operating Permit renewed on January 13, 2009. Please notify the Air Program Field Staff, Pat Simpson, at the Northeast District Office in Lawrence at (785) 842-4600 within 30 days of receipt of this permit, so that an evaluation may be conducted.

As provided for in K.S.A. 65-3008b(e), an owner or operator may request a hearing within 15 days after affirmation, modification, or reversal of a permit decision pursuant to subsection (b) of K.S.A. 65-3008a. In the Request for Hearing, the owner or operator shall specify the provision of this act or rule and regulation allegedly violated, the facts constituting the alleged violation, and secretary's intended action. Such request must be submitted to the Director, Office of Administrative Hearings, 1020 S. Kansas Avenue, Topeka, KS 66612-1327. Failure to submit a timely request shall result in a waiver of the right to hearing.

Include source ID number 1770030 in all communications with the KDHE regarding this facility.

If you have any questions regarding this permit, please contact me at (785) 296-0912 or email me at [Amid.Paudyal@ks.gov](mailto:Amid.Paudyal@ks.gov).

Sincerely,



Amid Paudyal  
Environmental Specialist  
Air Permitting Section

AP:saw  
Enclosure  
c: NEDO  
C-13688

## **AIR EMISSION SOURCE CONSTRUCTION PERMIT**

**Source ID No.:** 1770030

**Effective Date:** January 9, 2017

**Source Name:** Westar Energy, Inc., Tecumseh Energy Center

**SIC Code:** 4911, Electrical Services – electric power generation, transmission, or distribution

**NAICS Code:** 221112, Fossil fuel power generation

**Source Location:** 5530 SE 2<sup>nd</sup> Street  
Tecumseh, Shawnee County, Kansas 66542  
Section 31, Township 11S, Range 17E

**Mailing Address:** 818 South Kansas Avenue  
P.O. Box 889  
Topeka, Kansas 66601

**Contact Person(s):** Stephanie Hirner  
Supervisor, Air Permitting and Compliance  
Phone: (785) 575-8447  
Email: Stephanie.Hirner@westarenergy.com

**This permit is issued pursuant to K.S.A. 65-3008 as amended.**

### **I. Description of Activity Subject to Air Pollution Control Regulations**

Westar Energy, Inc. (Westar) is proposing to accept a federally enforceable emission limitation on the Combustion Engineering Boiler identified as EU-BLR7/9, located at the Tecumseh Energy Center (TEC) in Tecumseh, Kansas.

The U.S. Environmental Protection Agency's (EPA) sulfur dioxide (SO<sub>2</sub>) Data Requirements Rule (DRR), requires that state agencies model or monitor air quality around large SO<sub>2</sub> emitting sources. In lieu of monitoring or modeling the air quality around large SO<sub>2</sub> emitters, air quality agencies can work with affected sources to accept a 2,000 ton per year SO<sub>2</sub> limit. Westar has agreed to accept an appropriate federally enforceable emission limitation on SO<sub>2</sub>, effective January 13, 2017.

The Kansas Department of Health and Environment (KDHE) reviewed the air quality requirements for the proposed equipment. There will be no increase in emission as part of this permit action. However, this activity requires a permit under the requirements of K.A.R. 28-19-300(a)(2) (Construction permits and approvals; applicability) because it includes a federal enforceable permit limit.

## **II. Significant Applicable Air Pollution Control Regulations**

The proposed activity is subject to Kansas Administrative Regulations (K.A.R.) relating to air pollution control. The following air quality regulations were determined to be applicable to this activity:

K.A.R. 28-19-300, Construction permits and approvals; applicability.

## **III. Air Emission Unit Limitations**

Beginning with calendar year 2017 and thereafter, EU-BLR7/9 shall be limited to below 2,000 tons per year SO<sub>2</sub> emissions on a 12-month rolling total basis. This limit does not apply retrospectively. The 12-month total will begin to accrue with the January 2017 emissions, therefore the first complete 12-month rolling total will include January 2017 through December 2017 emissions.

## **IV. Monitoring and Recordkeeping**

The owner or operator shall maintain records of SO<sub>2</sub> emissions from the emission unit EU-BLR7/9 on a 12-month rolling total basis. Recordkeeping will begin with the collection of the January 2017 SO<sub>2</sub> data, and will accrue each month until a complete 12-months of SO<sub>2</sub> data is collected, which will roll thereafter.

## **V. Notifications**

Notify the Air Program Field Staff, Pat Simpson, at the Northeast District Office in Lawrence at (785) 842-4600 within 30 days of receipt of this permit, so that an evaluation may be conducted.

## **VI. General Provisions**

- A. A construction permit or approval must be issued by the KDHE prior to commencing any construction or modification of equipment or processes which results in potential-to-emit increases equal to or greater than the thresholds specified at K.A.R. 28-19-300.
- B. Upon presentation of credentials and other documents as may be required by law, representatives of the KDHE (including authorized contractors of the KDHE) shall be allowed to:
  - 1. enter upon the premises where a regulated facility or activity is located or conducted or where records must be kept under conditions of this document;
  - 2. have access to and copy, at reasonable times, any records that must be kept under conditions of this document;
  - 3. inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this document; and
  - 4. sample or monitor, at reasonable times, for the purposes of assuring compliance with this document or as otherwise authorized by the Secretary of the KDHE, any substances or parameters at any location.
- C. The emission unit or stationary source which is the subject of this document shall be operated in compliance with all applicable requirements of the Kansas Air Quality Act and the Federal Clean Air Act.

- D. This document is subject to periodic review and amendment as deemed necessary to fulfill the intent and purpose of the Kansas Air Quality Statutes and Regulations.
- E. This document does not relieve the permittee of the obligation to obtain any approvals, permits, licenses or documents of sanction which may be required by other federal, state, or local agencies.

**Permit Writer**



Amid Paudyal  
Environmental Specialist  
Air Permitting Section

01/09/2017

Date Signed

AP:saw  
c: NEDO  
C-13688

**To:** Davis, Scott[Davis.ScottR@epa.gov]  
**Cc:** Benjamin, Lynorae[benjamin.lynorae@epa.gov]; Scofield, Steven[Scofield.Steve@epa.gov]; Bradley, Twunjala[Bradley.Twunjala@epa.gov]; Wong, Richard[Wong.Richard@epa.gov]; Hays, Karen[Karen.Hays@dnr.ga.gov]; Kuoh, Dika[Dika.Kuoh@dnr.ga.gov]; Munsey, Elisabeth[Elisabeth.Munsey@dnr.ga.gov]; Tian, Di[Di.Tian@dnr.ga.gov]; Basnight, Deborah[deborah.basnight@dnr.ga.gov]; Kim, Yunhee[Yunhee.Kim@dnr.ga.gov]  
**From:** Boylan, James  
**Sent:** Mon 6/26/2017 7:32:07 PM  
**Subject:** Georgia Power-Plant Scherer 2017 Annual Report for EPA's SO2 Data Requirements Rule  
[GAEPD Plant Scherer 2017 SO2 Annual Report.pdf](#)

Dear Mr. Davis,

As required by the Data Requirements Rule for the 2010 1-Hour SO<sub>2</sub> NAAQS, the attached report documents the annual SO<sub>2</sub> emissions of each applicable source in the Juliette, GA area. The 2015 and 2016 annual SO<sub>2</sub> emissions for Plant Scherer are well below the 2012-2014 SO<sub>2</sub> emissions that were modeled for attainment. Therefore, EPD has determined that no additional modeling is needed to characterize air quality in the Juliette, GA area to determine whether the area meets or does not meet the 2010 SO<sub>2</sub> NAAQS.

A hard copy of this annual report has been mailed to Ms. Anne Heard, Acting Administrator for EPA Region 4. Should you or your staff have any questions, please feel free to contact me at (404) 363-7014.

Sincerely,

Jim Boylan

-----  
James W. Boylan, Ph.D.

Manager, Planning & Support Program

Georgia Department of Natural Resources

Environmental Protection Division - Air Protection Branch

4244 International Parkway, Suite 120

Atlanta, GA 30354

Office: 404-363-7014 Fax: 404-363-7100

E-mail: [James.Boylan@dnr.ga.gov](mailto:James.Boylan@dnr.ga.gov)

---

**Air Protection Branch**

4244 International Parkway, Suite 120  
Atlanta, Georgia 30354  
404-363-7000

June 26, 2017

Ms. Anne Heard  
Acting Administrator  
U.S. EPA, Region 4  
61 Forsyth Street, SW  
Atlanta, Georgia 30303-8909

**RE: Georgia Power-Plant Scherer Annual Report for EPA's Data Requirements Rule for the 2010 1-Hour SO<sub>2</sub> NAAQS**

Dear Ms. Heard:

On July 12, 2016 (FR 81 45039), the U.S. Environmental Protection Agency (EPA) designated Juliette, GA (Butts County, Crawford County, Jasper County, Jones County, Lamar County, Monroe County, and Upson County) as Unclassifiable/Attainment with an effective date of September 12, 2016. This designation was based on 2012-2014 modeling submitted to EPA by the Georgia Environmental Protection Division (EPD), which demonstrated that SO<sub>2</sub> emissions from Plant Scherer do not cause or contribute to any exceedances of the 1-hour SO<sub>2</sub> NAAQS. The highest modeled SO<sub>2</sub> design value in the modeling domain was 49.1 ppb (37.5 ppb from Plant Scherer, plus background value of 11.6 ppb).

Table 1 contains the SO<sub>2</sub> emissions that were modeled (2012 -2014), along with EPA's Clean Air Markets Division (CAMD) SO<sub>2</sub> emissions (2012-2016). The modeled emissions are always slightly higher than the CAMD emissions because hourly emissions for partial operating hours are not adjusted downward in the model to reflect operating time less than one hour.

**Table 1. SO<sub>2</sub> emissions from Plant Scherer for 2012-2016.**

Calendar Year	CAMD SO <sub>2</sub> Emissions (Tons/Year)	Modeled SO <sub>2</sub> Emissions (Tons/Year)
2012	42,349.2	42,354.9
2013	24,074.6	24,078.5
2014	5,175.5	5181.0
2015	1,618.3	
2016	1,984.5	

According to the Data Requirements Rule for the 2010 1-hour SO<sub>2</sub> primary NAAQS (FR 80 51052):

*“For any area where modeling of actual SO<sub>2</sub> emissions serve as the basis for designating such area as attainment for the 2010 SO<sub>2</sub> NAAQS, the air agency shall submit an annual report to the EPA Regional Administrator by July 1 of each year...that documents the*

*annual SO<sub>2</sub> emissions of each applicable source in each such area... The first report for each such area is due by July 1 of the calendar year after the effective date of the area's initial designation."*

The 2015 and 2016 annual SO<sub>2</sub> emissions for Plant Scherer are well below the 2012-2014 SO<sub>2</sub> emissions that were modeled for attainment. Therefore, EPD has determined that no additional modeling is needed to characterize air quality in the Juliette, GA area to determine whether the area meets or does not meet the 2010 SO<sub>2</sub> NAAQS.

A copy of this letter is available for public inspection at 4244 International Parkway, Suite 120, Atlanta, GA 30354. In addition, the public can inspect an electronic version of this letter at: <https://epd.georgia.gov/air/documents/georgia-power-plant-scherer-annual-report-data-requirements-rule-2010-1-hour-so2-naaqs>.

Should you or your staff have any questions or comments, please feel free to contact Jim Boylan at [James.Boylan@dnr.ga.gov](mailto:James.Boylan@dnr.ga.gov) or 404-363-7014.

Sincerely,



Karen D. Hays, P.E.  
Chief, Air Protection Branch  
Georgia Environmental Protection Division

**To:** Banister, Beverly[Banister.Beverly@epa.gov]; Davis, Scott[Davis.ScottR@epa.gov]; Worley, Gregg[Worley.Gregg@epa.gov]; Benjamin, Lynorae[benjamin.lynorae@epa.gov]; Rinck, Todd[Rinck.Todd@epa.gov]; Bradley, Twunjala[Bradley.Twunjala@epa.gov]; Gillam, Rick[Gillam.Rick@epa.gov]; Howard, Chris[Howard.Chris@epa.gov]; Krivo, Stan[Krivo.Stanley@epa.gov]; Walther, Katherine[Walther.Katherine@epa.gov]  
**Cc:** Munsey, Elisabeth[Elisabeth.Munsey@dnr.ga.gov]; Tian, Di[Di.Tian@dnr.ga.gov]; Kim, Yunhee[Yunhee.Kim@dnr.ga.gov]; Hays, Karen[Karen.Hays@dnr.ga.gov]; Kuoh, Dika[Dika.Kuoh@dnr.ga.gov]  
**From:** Boylan, James  
**Sent:** Wed 5/31/2017 4:44:41 PM  
**Subject:** RE: Plant Bowen Modeling for EPA's Data Requirements Rule for the 2010 1-Hour SO2 NAAQS  
[EPD Addendum To Plant Bowen SO2 Modeling 05-31-2017.pdf](#)

Dear Ms. Banister,

On December 28, 2016, the Georgia Environmental Protection Division (EPD) submitted 2012-2014 modeling to be used for SO<sub>2</sub> designations for Georgia Power Plant Bowen. On March 8, 2017, EPD received written comments from EPA regarding this modeling. The attached modeling addendum includes updated modeling results for Plant Bowen and provides additional justifications related to the background concentration used to account for offsite sources. A hard copy of this document along with a copy of all modeling inputs/output files on a DVD have been placed in the mail.

Should you or your staff have any questions, please feel free to contact me at (404) 363-7014.

Sincerely,

Jim Boylan

-----  
James W. Boylan, Ph.D.

Manager, Planning & Support Program

Georgia Department of Natural Resources

Environmental Protection Division - Air Protection Branch

4244 International Parkway, Suite 120

Atlanta, GA 30354

Office: 404-363-7014 Fax: 404-363-7100

E-mail: [James.Boylan@dnr.ga.gov](mailto:James.Boylan@dnr.ga.gov)

-----

**From:** Boylan, James

**Sent:** Wednesday, December 28, 2016 2:50 PM

**To:** 'Banister.Beverly@epa.gov'; 'davis.scottr@epa.gov'; 'Worley.Gregg@epa.gov'; benjamin.lynora@epa.gov; 'rinck.todd@epa.gov'; Bradley, Twunjala (Bradley.Twunjala@epa.gov); Gillam, Rick (Gillam.Rick@epa.gov); 'Howard.Chris@epa.gov'; 'Krivo.Stanley@epa.gov'

**Cc:** Munsey, Elisabeth; Tian, Di; Kim, Yunhee; Hays, Karen; Kuoh, Dika

**Subject:** Plant Bowen Modeling for EPA's Data Requirements Rule for the 2010 1-Hour SO<sub>2</sub> NAAQS

Dear Ms. Banister,

On June 8, 2016, the Georgia Environmental Protection Division (EPD) submitted a letter to EPA describing the approach that will be used to characterize air quality at sources in Georgia that had annual actual SO<sub>2</sub> emissions exceeding 2,000 tons per year (tpy) in 2014. In that letter, EPD stated that Georgia Power Plant Bowen would be characterized with air quality modeling. A modeling protocol was submitted to EPA on June 17, 2016. This submittal contains 2012-2014 modeling that can be used for SO<sub>2</sub> designations.

A total of three (3) attachments are included:

- (1) a copy of the cover letter from Ms. Karen Kays (EPD) to Ms. Beverly Banister (EPA),
- (2) a final modeling report created by EPD, and
- (3) a modeling report submitted by Georgia Power to EPD.

A hard copy of these three documents along with a copy of all modeling inputs/output files on a DVD have been placed in the mail. Should you or your staff have any questions, please feel free

to contact me at (404) 363-7014.

Sincerely,

Jim Boylan

---

James W. Boylan, Ph.D.

Manager, Planning & Support Program

Georgia Department of Natural Resources

Environmental Protection Division - Air Protection Branch

4244 International Parkway, Suite 120

Atlanta, GA 30354

Office: 404-363-7014 Fax: 404-363-7100

E-mail: [James.Boylan@dnr.ga.gov](mailto:James.Boylan@dnr.ga.gov)

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# **Plant Bowen Modeling Addendum**

## **Submitted by Georgia EPD**

### **May 31, 2017**

The Georgia Environmental Protection Division (EPD) reviewed EPA's comments on the modeling submitted for Plant Bowen to meet the requirements of the Data Requirements Rule for the 2010 1-hour SO<sub>2</sub> NAAQS (40 CFR 51.1203). This modeling addendum includes updated modeling results for Plant Bowen and provides additional justifications related to the background concentration used to account for offsite sources.

### **Model Versions**

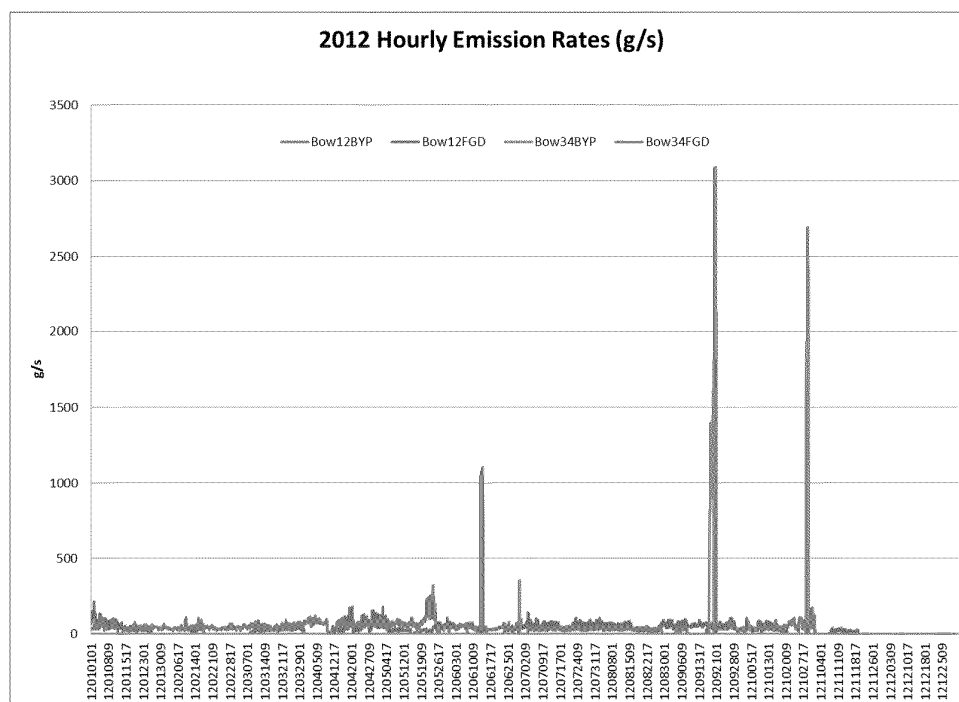
In the original modeling submittal, EPD used AERMET (v15181) and AERMOD (v15181). In this new modeling submittal, EPD used AERMET (v16216) with ADJ\_U\* option and AERMOD (v16216r). All other modeling options are identical to the original modeling submittal on December 28, 2016.

### **SO<sub>2</sub> Emission Rates for Plant Bowen**

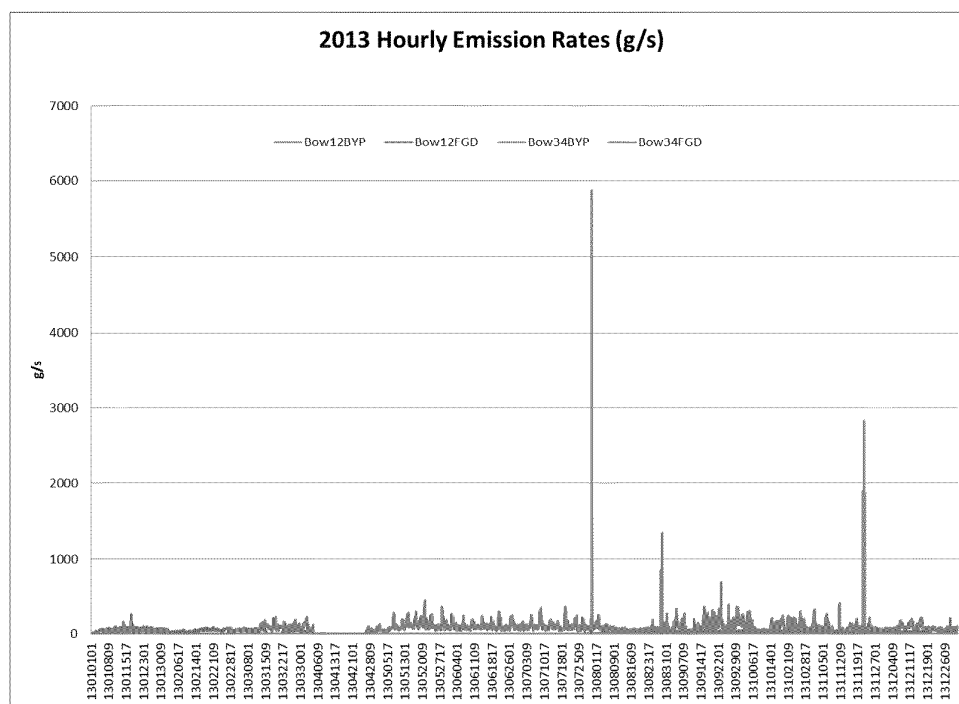
EPA identified a number of discrepancies between the hourly SO<sub>2</sub> emission rates used in EPD's modeling and the hourly SO<sub>2</sub> emission rates reported to EPA's Clean Air Markets Division (CAMD) under the Acid Rain Program using continuous emissions monitoring systems (CEMS). EPD has updated the hourly SO<sub>2</sub> emission rates used in the modeling to match the hourly SO<sub>2</sub> emission rates reported to EPA's CAMD. Table 1 shows a comparison of annual SO<sub>2</sub> emissions that were modeled vs. annual SO<sub>2</sub> emissions from EPA's CAMD database. The modeled emissions are always slightly higher than the CAMD emissions ( $\leq 4$  TPY) because hourly emissions for partial operating hours are not adjusted downward in the model to reflect operating time less than one hour. Figures 1-3 show the hourly SO<sub>2</sub> emission rates (g/s) that were modeled through each stack for BOW12BYP, BOW12FGD, BOW34BYP, and BOW34FGD in 2012, 2013, and 2014.

**Table 1.** Comparison of annual SO<sub>2</sub> emissions that were modeled vs. annual SO<sub>2</sub> emissions from EPA's CAMD database for 2012, 2013, and 2014.

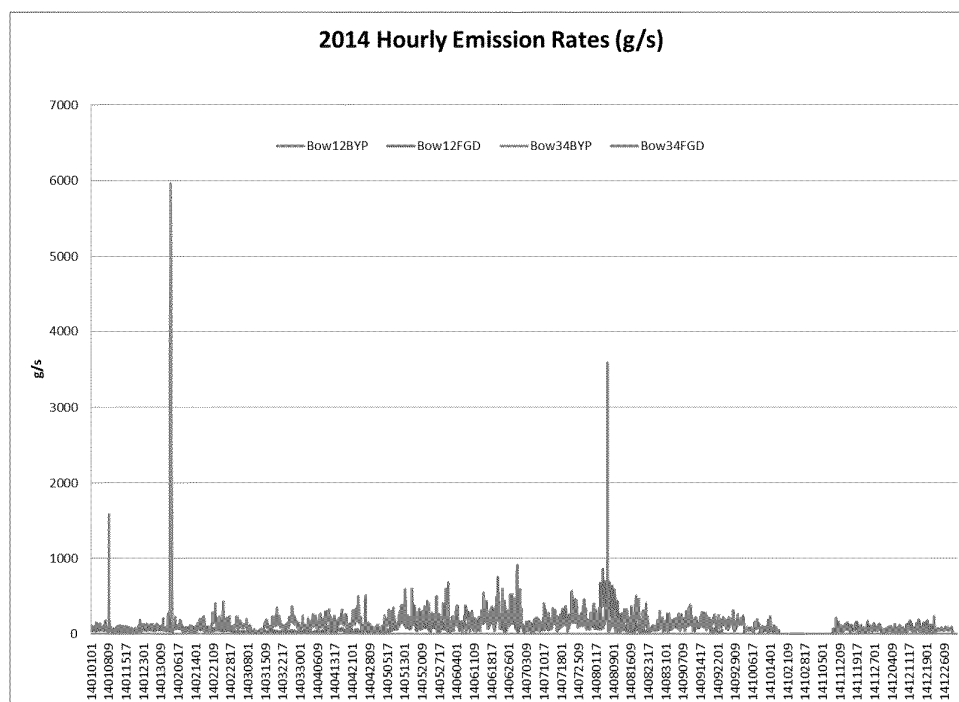
<b>FACILITY-Unit</b>	<b>2012 Model (TPY)</b>	<b>2012 CAMD (TPY)</b>	<b>2013 Model (TPY)</b>	<b>2013 CAMD (TPY)</b>	<b>2014 Model (TPY)</b>	<b>2014 CAMD (TPY)</b>
Plant Bowen – Units 1 & 2	1,398.8	1,397.0	853.1	852.1	2,831.0	2,830.9
Plant Bowen – Units 3 & 4	1,722.4	1,721.5	2,662.8	2,658.8	4,374.5	4,373.0



**Figure 1.** Hourly (2012) SO<sub>2</sub> emission rates (g/s) modeled through each stack for Georgia Power Plant Bowen.



**Figure 2.** Hourly (2013) SO<sub>2</sub> emission rates (g/s) modeled through each stack for Georgia Power Plant Bowen.

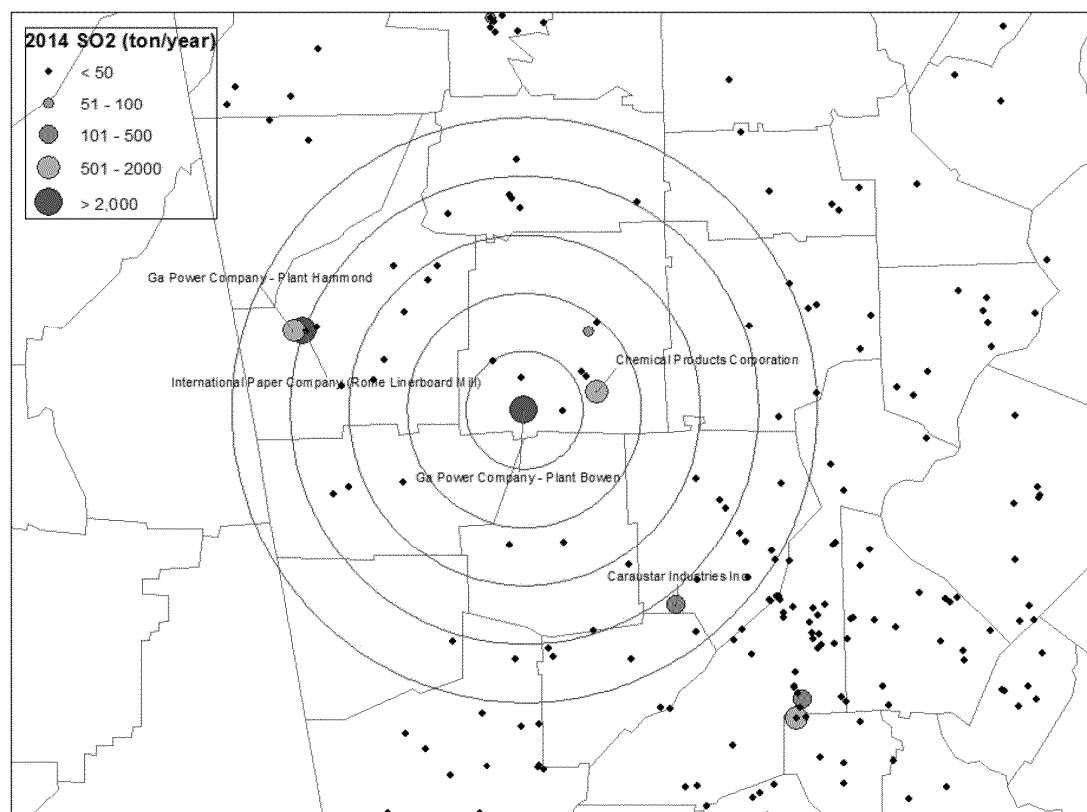


**Figure 3.** Hourly (2014) SO<sub>2</sub> emission rates (g/s) modeled through each stack for Georgia Power Plant Bowen.

### **Offsite Sources and Background Concentration**

EPA identified an offsite source (Chemical Products Corporation) that was not included in the initial EPD analysis. Figure 4 contains a spatial map of actual annual 2014 SO<sub>2</sub> emissions (TPY) from the draft 2014 NEI\_v1 for all sources within 50 km of Plant Bowen. Table 2 contains a detailed list of facilities within 50 km from Plant Bowen and the 2014 emission (TPY)/distance (km), or Q/d. Two facilities (IP-Rome and Chemical Products Corporation) have Q/d values larger than 20. IP-Rome (2,355.7 TPY) is more than 40 km away and has been modeled separately to help relocate the current SO<sub>2</sub> monitor in Rome to the location of maximum impact as part of the Data Requirements Rule for the 2010 1-hour SO<sub>2</sub> NAAQS. Chemical Products Corporation (565.3 TPY) is located 12.7 km from Plant Bowen. All the remaining Q/d values are less than 20.

No offsite sources were explicitly modeled since there is complex terrain near Chemical Products Corporation which will likely result in an overestimation of SO<sub>2</sub> impacts. Based on modeling performed for a similar nearby facility (International Paper Company in Rome, GA), the overestimation can be as high as a factor of 10. In addition, no SO<sub>2</sub> emissions data is available for Chemical Products Corporation in the NEI for 2012 and 2013. Even if the 2012 and 2013 SO<sub>2</sub> emissions were available, we believe the modeled impacts would be overestimated due to the complex terrain.



**Figure 4.** Map of actual annual 2014 SO<sub>2</sub> emissions (TPY) from offsite sources near Plant Bowen. Red circles are placed in 10 km increments out to 50 km.

**Table 2.** List of facilities within 50 km from Plant Bowen, 2014 SO<sub>2</sub> emission (YPY), distance (km), and emissions/distance (Q/d).

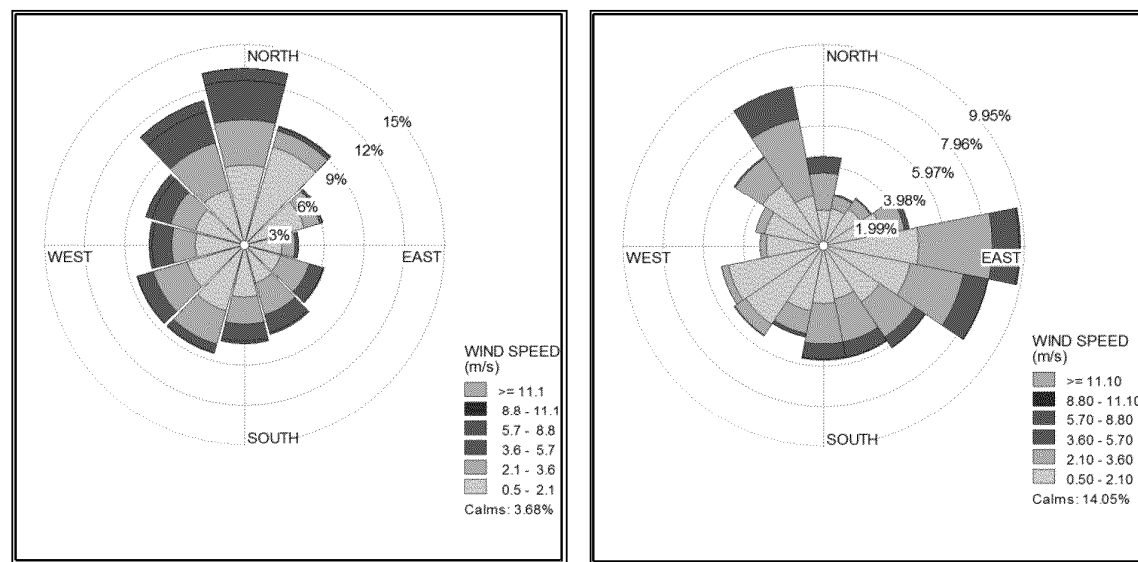
FACILITY ID	FACILITY NAME	2014 SO <sub>2</sub> Emissions (TPY)	distance (km)	Q/d
1500011	Ga Power Company - Plant Bowen	7204.0	0	N/A
11500021	International Paper - Rome (IP-Rome)	2355.7	40.0	59
1500008	Chemical Products Corporation	565.3	12.7	44
11500003	Ga Power Company - Plant Hammond	526.5	41.7	13
6700022	Caraustar Industries Inc	485.9	42.4	11
1500032	Gerdau Ameristeel US Inc.	82.1	17.3	5
11500105	General Shale Brick, Inc. - Plant 40	45.9	38.0	1
1500061	Anheuser-Busch Inc	3.6	19.5	0
5700040	Pine Bluff Landfill	7.1	51.6	0
6700027	Lockheed Martin Aeronautics Company	2.1	42.4	0
11500077	Ball Container LLC Rome Can Plant	0.1	27.6	0
12900028	J. M. Huber Corporation Solem Division - Fairmount Plant	0.1	40.4	0
4500039	Printpack Inc	0.0	42.5	0
11500095	Packaging Products Corporation, LLC	0.0	26.3	0
11500073	Lifoam Industries, Inc.	0.0	25.4	0
23300029	Kimoto Tech	0.0	35.6	0
11500016	Georgia-Pacific Wood Products South LLC Lumber Plant	0.0	39.6	0

To account for the impacts from Chemical Products Corporation and the other offsite sources, EPD updated the background SO<sub>2</sub> concentration from 35.0 ppb to 45.7 ppb. This is considered a very conservative background concentration estimate as explained below.

The background concentrations for both Chemical Products Corporation and IP-Rome were based on observations from the nearest SO<sub>2</sub> monitor. The nearest SO<sub>2</sub> monitor is located in Rome, GA. For Chemical Products Corporation, the measured 3-year design value from the SO<sub>2</sub> monitor in Rome, GA was adjusted to the maximum impact location and adjusted by the ratio of SO<sub>2</sub> emissions between IP-Rome and Chemical Products Corporation. This will produce a realistic estimate of the SO<sub>2</sub> impacts since both IP-Rome and Chemical Products Corporation have similar meteorology, surface characteristics, topography, and stack heights (see discussion below). For IP-Rome, the measured 3-year design value from the SO<sub>2</sub> monitor in Rome, GA was adjusted to the maximum impact at the south/east domain border. This will produce a conservative estimate of the SO<sub>2</sub> impacts from IP-Rome in the Plant Bowen modeling domain.

### Similar Meteorology

The IP-Rome modeling used surface observations from the Rome airport. The Plant Bowen modeling used surface observations from the Cartersville airport. Both set of modeling used aloft observations from the Peachtree City, GA NWS station. A comparison of the 2012-2014 wind speed and wind directions from the Rome airport and Cartersville airport are contained in Figure 5. Table 3 contains a comparison of the wind speed bins for the Rome airport and Cartersville airport. The wind speed bins are very similar between the two locations. The wind directions show some differences, but the wind direction is not relevant in this analysis since the same background concentration will be applied to all receptors in the Plant Bowen domain.



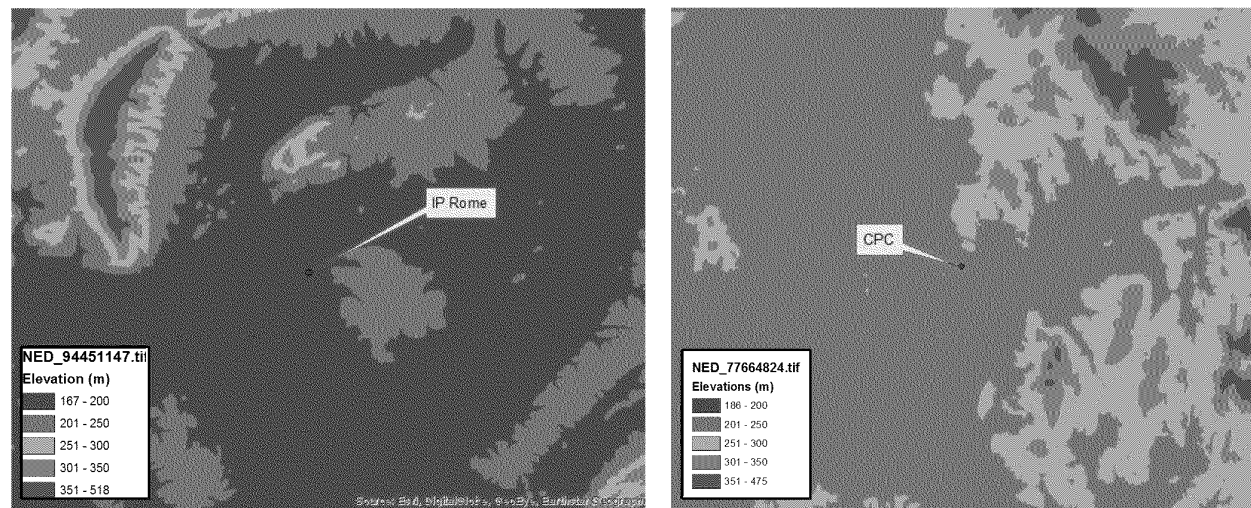
**Figure 5.** Wind roses at the Rome airport (left) and the Cartersville airport (right).

**Table 3.** Comparison of the wind speed bins for the Rome airport and Cartersville airport.

Wind Speed Bins	KRMG (Rome)	KVPC (Cartersville)
Calms	8.0%	14.0%
0.50 - 2.10	46.5%	51.8%
2.10 - 3.60	27.6%	25.1%
3.60 - 5.70	14.6%	7.7%
5.70 - 8.80	2.9%	0.3%
8.80 - 11.10	0.1%	0.0%
$\geq 11.10$	0.0%	0.0%
Missing/Incomplete	0.2%	1.1%

### Similar Topography

A comparison of the topographical features near IP-Rome and Chemical Products Corporation are contained in Figure 6. Both locations are in complex terrain with hill tops well above the top of the stacks.



**Figure 6.** Terrain elevations (m) near IP-Rome (left) and Chemical Products Corporation (right) shown on a 10 x 10 km domain.

### Similar Surface Characteristics

A comparison of the surface characteristics (albedo, Bowen ratio, and surface roughness) near IP-Rome and Chemical Products Corporation are shown in Tables 4 and 5. Both sets used AERSURFACE (13016) derived for twelve 30-degree sectors out to 1 km at a seasonal temporal resolution for average surface moisture conditions. Albedo, Bowen Ratio, and seasonal average surface roughness for summer and fall are nearly identical at both locations. The seasonal average surface roughness for winter and spring are slightly higher at IP-Rome. Overall, there are no significant differences in the albedo, Bowen ratio, and surface roughness between the two locations.

**Table 4.** Comparisons of surface characteristics at IP-Rome and Chemical Product Corp (CPC).

Season	Wind Sector	IP_Rome			CPC		
		Albedo	Bowen Ratio	Surface Roughness	Albedo	Bowen Ratio	Surface Roughness
Winter	1 of 12	0.15	0.80	0.26	0.16	0.86	0.15
Winter	2 of 12	0.15	0.80	0.41	0.16	0.86	0.19
Winter	3 of 12	0.15	0.80	0.40	0.16	0.86	0.18
Winter	4 of 12	0.15	0.80	0.31	0.16	0.86	0.12
Winter	5 of 12	0.15	0.80	0.31	0.16	0.86	0.15
Winter	6 of 12	0.15	0.80	0.11	0.16	0.86	0.09
Winter	7 of 12	0.15	0.80	0.16	0.16	0.86	0.09
Winter	8 of 12	0.15	0.80	0.15	0.16	0.86	0.09
Winter	9 of 12	0.15	0.80	0.23	0.16	0.86	0.10
Winter	10 of 12	0.15	0.80	0.34	0.16	0.86	0.25
Winter	11 of 12	0.15	0.80	0.47	0.16	0.86	0.31
Winter	12 of 12	0.15	0.80	0.49	0.16	0.86	0.33
Winter	Average	0.15	0.80	0.30	0.16	0.86	0.17
Spring	1 of 12	0.14	0.57	0.29	0.15	0.59	0.20
Spring	2 of 12	0.14	0.57	0.46	0.15	0.59	0.25
Spring	3 of 12	0.14	0.57	0.46	0.15	0.59	0.26
Spring	4 of 12	0.14	0.57	0.37	0.15	0.59	0.19
Spring	5 of 12	0.14	0.57	0.33	0.15	0.59	0.22
Spring	6 of 12	0.14	0.57	0.12	0.15	0.59	0.12
Spring	7 of 12	0.14	0.57	0.17	0.15	0.59	0.11
Spring	8 of 12	0.14	0.57	0.17	0.15	0.59	0.11
Spring	9 of 12	0.14	0.57	0.24	0.15	0.59	0.12
Spring	10 of 12	0.14	0.57	0.37	0.15	0.59	0.29
Spring	11 of 12	0.14	0.57	0.51	0.15	0.59	0.38
Spring	12 of 12	0.14	0.57	0.50	0.15	0.59	0.43
Spring	Average	0.14	0.57	0.33	0.15	0.59	0.22
Summer	1 of 12	0.15	0.34	0.37	0.16	0.39	0.30
Summer	2 of 12	0.15	0.34	0.53	0.16	0.39	0.43
Summer	3 of 12	0.15	0.34	0.54	0.16	0.39	0.56
Summer	4 of 12	0.15	0.34	0.54	0.16	0.39	0.49
Summer	5 of 12	0.15	0.34	0.35	0.16	0.39	0.43
Summer	6 of 12	0.15	0.34	0.14	0.16	0.39	0.24
Summer	7 of 12	0.15	0.34	0.19	0.16	0.39	0.18
Summer	8 of 12	0.15	0.34	0.23	0.16	0.39	0.26
Summer	9 of 12	0.15	0.34	0.26	0.16	0.39	0.17
Summer	10 of 12	0.15	0.34	0.39	0.16	0.39	0.32
Summer	11 of 12	0.15	0.34	0.53	0.16	0.39	0.48
Summer	12 of 12	0.15	0.34	0.53	0.16	0.39	0.67
Summer	Average	0.15	0.34	0.38	0.16	0.39	0.38
Fall	1 of 12	0.15	0.80	0.37	0.16	0.86	0.30
Fall	2 of 12	0.15	0.80	0.53	0.16	0.86	0.42
Fall	3 of 12	0.15	0.80	0.54	0.16	0.86	0.56
Fall	4 of 12	0.15	0.80	0.54	0.16	0.86	0.49
Fall	5 of 12	0.15	0.80	0.35	0.16	0.86	0.43
Fall	6 of 12	0.15	0.80	0.14	0.16	0.86	0.24
Fall	7 of 12	0.15	0.80	0.19	0.16	0.86	0.17
Fall	8 of 12	0.15	0.80	0.23	0.16	0.86	0.26
Fall	9 of 12	0.15	0.80	0.26	0.16	0.86	0.16
Fall	10 of 12	0.15	0.80	0.39	0.16	0.86	0.30
Fall	11 of 12	0.15	0.80	0.53	0.16	0.86	0.46
Fall	12 of 12	0.15	0.80	0.53	0.16	0.86	0.66
Fall	Average	0.15	0.80	0.38	0.16	0.86	0.37

**Table 5.** Comparisons of surface characteristics at IP-Rome and Chemical Product Corp (CPC).

Season	Wind sector	IP_Rome – CPC			(IP_Rome – CPC)/IP_Rome		
		$\Delta$ (Albedo)	$\Delta$ (Bowen Ratio)	$\Delta$ (Surface Roughness)	% (Albedo)	% (Bowen Ratio)	% (Surface Roughness)
Winter	1 of 12	-0.01	-0.06	0.11	-6.7%	-7.5%	41.6%
Winter	2 of 12	-0.01	-0.06	0.23	-6.7%	-7.5%	54.7%
Winter	3 of 12	-0.01	-0.06	0.22	-6.7%	-7.5%	54.8%
Winter	4 of 12	-0.01	-0.06	0.19	-6.7%	-7.5%	60.7%
Winter	5 of 12	-0.01	-0.06	0.17	-6.7%	-7.5%	52.5%
Winter	6 of 12	-0.01	-0.06	0.02	-6.7%	-7.5%	17.0%
Winter	7 of 12	-0.01	-0.06	0.07	-6.7%	-7.5%	44.6%
Winter	8 of 12	-0.01	-0.06	0.06	-6.7%	-7.5%	42.0%
Winter	9 of 12	-0.01	-0.06	0.13	-6.7%	-7.5%	56.9%
Winter	10 of 12	-0.01	-0.06	0.09	-6.7%	-7.5%	25.6%
Winter	11 of 12	-0.01	-0.06	0.16	-6.7%	-7.5%	34.7%
Winter	12 of 12	-0.01	-0.06	0.16	-6.7%	-7.5%	32.4%
Winter	Average	-0.01	-0.06	0.13	-6.7%	-7.5%	43.9%
Spring	1 of 12	-0.01	-0.02	0.09	-7.1%	-3.5%	32.2%
Spring	2 of 12	-0.01	-0.02	0.21	-7.1%	-3.5%	45.1%
Spring	3 of 12	-0.01	-0.02	0.20	-7.1%	-3.5%	42.9%
Spring	4 of 12	-0.01	-0.02	0.19	-7.1%	-3.5%	50.0%
Spring	5 of 12	-0.01	-0.02	0.12	-7.1%	-3.5%	35.4%
Spring	6 of 12	-0.01	-0.02	0.00	-7.1%	-3.5%	0.0%
Spring	7 of 12	-0.01	-0.02	0.06	-7.1%	-3.5%	37.2%
Spring	8 of 12	-0.01	-0.02	0.06	-7.1%	-3.5%	33.7%
Spring	9 of 12	-0.01	-0.02	0.12	-7.1%	-3.5%	48.8%
Spring	10 of 12	-0.01	-0.02	0.07	-7.1%	-3.5%	20.3%
Spring	11 of 12	-0.01	-0.02	0.13	-7.1%	-3.5%	25.1%
Spring	12 of 12	-0.01	-0.02	0.07	-7.1%	-3.5%	14.1%
Spring	Average	-0.01	-0.02	0.11	-7.1%	-3.5%	32.9%
Summer	1 of 12	-0.01	-0.05	0.06	-6.7%	-14.7%	17.2%
Summer	2 of 12	-0.01	-0.05	0.10	-6.7%	-14.7%	19.7%
Summer	3 of 12	-0.01	-0.05	-0.02	-6.7%	-14.7%	-4.1%
Summer	4 of 12	-0.01	-0.05	0.05	-6.7%	-14.7%	9.5%
Summer	5 of 12	-0.01	-0.05	-0.08	-6.7%	-14.7%	-21.5%
Summer	6 of 12	-0.01	-0.05	-0.10	-6.7%	-14.7%	-74.5%
Summer	7 of 12	-0.01	-0.05	0.01	-6.7%	-14.7%	5.8%
Summer	8 of 12	-0.01	-0.05	-0.03	-6.7%	-14.7%	-13.3%
Summer	9 of 12	-0.01	-0.05	0.09	-6.7%	-14.7%	34.5%
Summer	10 of 12	-0.01	-0.05	0.07	-6.7%	-14.7%	18.8%
Summer	11 of 12	-0.01	-0.05	0.06	-6.7%	-14.7%	10.5%
Summer	12 of 12	-0.01	-0.05	-0.14	-6.7%	-14.7%	-26.8%
Summer	Average	-0.01	-0.05	0.01	-6.7%	-14.7%	1.7%
Fall	1 of 12	-0.01	-0.06	0.06	-6.7%	-7.5%	17.3%
Fall	2 of 12	-0.01	-0.06	0.11	-6.7%	-7.5%	21.0%
Fall	3 of 12	-0.01	-0.06	-0.02	-6.7%	-7.5%	-3.7%
Fall	4 of 12	-0.01	-0.06	0.05	-6.7%	-7.5%	9.5%
Fall	5 of 12	-0.01	-0.06	-0.08	-6.7%	-7.5%	-21.5%
Fall	6 of 12	-0.01	-0.06	-0.10	-6.7%	-7.5%	-74.5%
Fall	7 of 12	-0.01	-0.06	0.02	-6.7%	-7.5%	9.6%
Fall	8 of 12	-0.01	-0.06	-0.03	-6.7%	-7.5%	-12.1%
Fall	9 of 12	-0.01	-0.06	0.11	-6.7%	-7.5%	40.4%
Fall	10 of 12	-0.01	-0.06	0.09	-6.7%	-7.5%	24.0%
Fall	11 of 12	-0.01	-0.06	0.08	-6.7%	-7.5%	14.1%
Fall	12 of 12	-0.01	-0.06	-0.13	-6.7%	-7.5%	-24.8%
Fall	Average	-0.01	-0.06	0.01	-6.7%	-7.5%	3.5%

### Similar Stack Heights

A comparison of the stack heights and SO<sub>2</sub> emissions for IP-Rome and Chemical Products Corporation are contained in Table 6. Most of the SO<sub>2</sub> emissions from IP-Rome are emitted from two 55-meter stacks. Most of the SO<sub>2</sub> emissions from Chemical Products Corporation are emitted from a 58-meter stack.

**Table 6.** Summary of stack heights (m) and SO<sub>2</sub> emission rates (TPY) at International Paper-Rome (IP-Rome) and Chemical Products Corporation (CPC).

IP-Rome	Stack Height (m)	3 Years Averaged Emission Rate (TPY)	CPC	Stack Height (m)	2014 Emission Rate (TPY)
LK1A	27	1.42	BCZ1	14	0.003
LK2A	27	3.12	BDZ3	15	0.003
PB4N180	55	908.95	BDZ4	9	0.001
PB4S180	55	1066.05	BDZ5	8	0.0006
PK2	27	0.10	BGZ1	14	0
RF5	76	18.95	BKZ1	59	0
SDT5	70	0.48	GBZ4	17	0.02238
WFBOC8	70	54.40	GBZ6	14	1.532
WFBOE8	70	57.28	TCZ1	24	0.0163
WFBOW8	70	56.36	TDZ1	20	0.002
			TGZ1	18	0.004
			TKZ1	58	563.73

### Background for Chemical Products Corporation

The 2012-2014 measured SO<sub>2</sub> design value at the Rome monitor is 46 ppb. The 2013-2015 design value (35 ppb) and 2014-2016 design value (42 ppb) are both lower than the 2012-2014 design value, therefore the 2012-2014 design value is a conservative starting point for this analysis. EPD submitted modeling to support the relocation of the Rome SO<sub>2</sub> monitor to the location of maximum impact as part of the Data Requirements Rule for the 2010 1-hour SO<sub>2</sub> NAAQS on April 11, 2016. In order to adjust the measured SO<sub>2</sub> design value to the maximum impact location (Figure 7), the 2012-2014 design value was increased by the ratio of the maximum normalized design value in the domain to the normalized design value (NDV) at the monitor location.

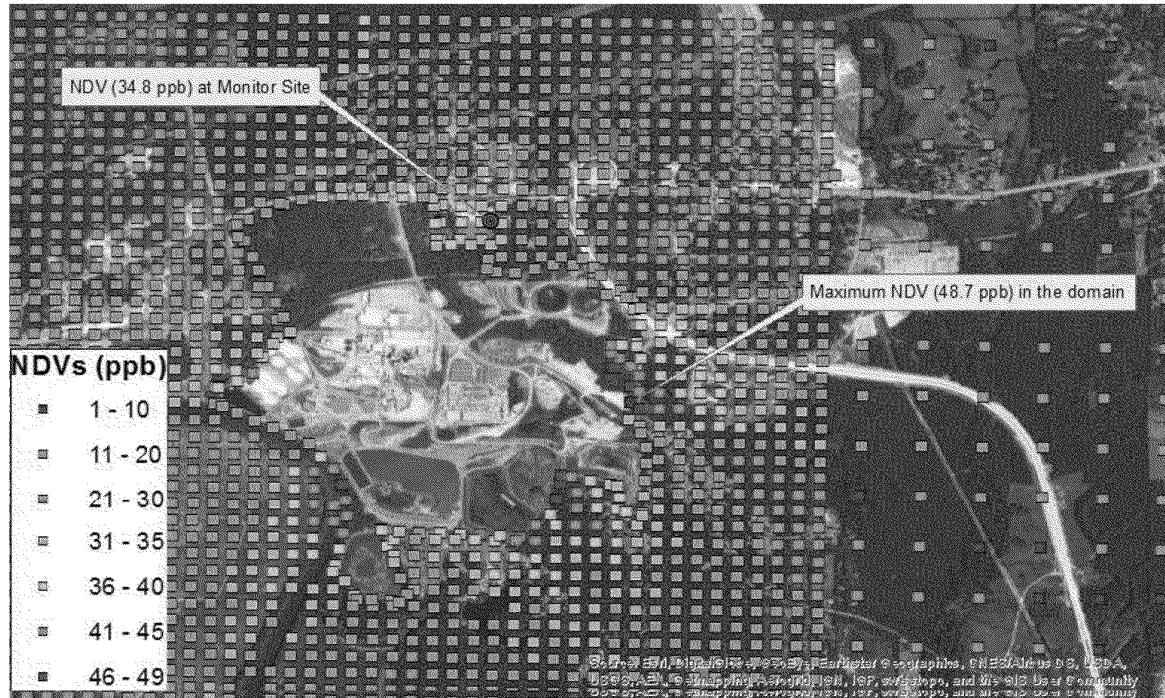
Maximum Adjusted Design Value (MADV) at IP-Rome

$$\begin{aligned} &= (\text{Maximum NDV in the domain})/(\text{NDV at the monitor}) \times (\text{Measured 2012-2014 DV}) \\ &= (48.7 \text{ ppb})/(34.8 \text{ ppb}) \times (46 \text{ ppb}) \\ &= \mathbf{64.4 \text{ ppb}} \end{aligned}$$

Then, the Maximum Adjusted Design Value at IP-Rome is adjusted downwards to account for the lower SO<sub>2</sub> emission rate at Chemical Products Corporation:

Maximum Adjusted Design Value at CPC

$$\begin{aligned}
 &= (\text{MADV at IP-Rome}) \times (\text{IP-Rome SO}_2 \text{ Emissions}) / (\text{IP-Rome SO}_2 \text{ Emissions}) \\
 &= (64.4 \text{ ppb}) \times (565.3 \text{ TPY}) / (2355.7 \text{ TPY}) \\
 &= \mathbf{15.4 \text{ ppb}}
 \end{aligned}$$



**Figure 7.** Map of IP Rome Normalized Design Values in the domain and at the monitor site.

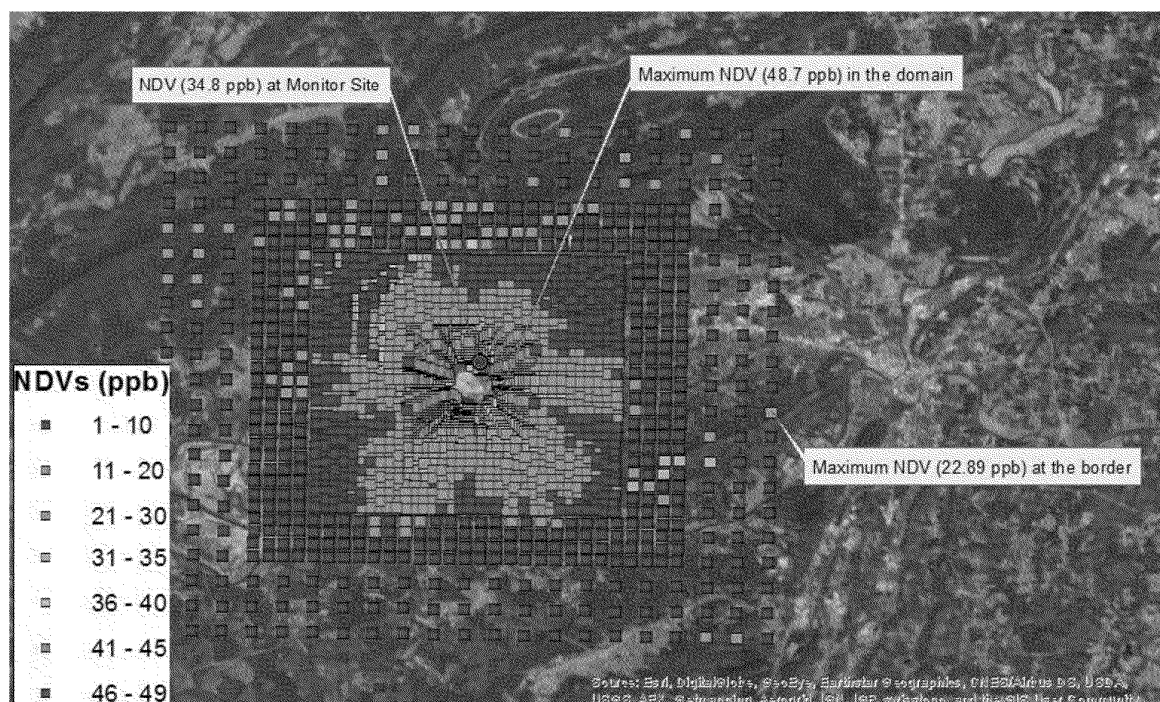
#### Background for International Paper-Rome

In order to adjust the maximum adjusted design value at IP-Rome to the background value in the Plant Bowen modeling domain, the maximum adjusted design value was decreased by the ratio of the maximum normalized design value at the east/south borders of the IP-Rome modeling domain to the maximum normalized design value in the entire IP-Rome modeling domain (Figure 8).

Maximum Adjusted Design Value at IP-Rome Border

$$\begin{aligned}
 &= (\text{MADV at IP-Rome}) \times (\text{Max NDV at the east/south borders}) / (\text{Max NDV in the domain}) \\
 &= (64.4 \text{ ppb}) \times (22.9 \text{ ppb}) / (48.7 \text{ ppb}) \\
 &= \mathbf{30.3 \text{ ppb}}
 \end{aligned}$$

This value is considered very conservative since SO<sub>2</sub> impacts will continue to decrease at additional distances beyond the IP-Rome domain boundary.



**Figure 8.** Map of IP Rome Normalized Design Values in the domain and at the monitor site.

#### Total Background for Modeling Domain

The total background will be the sum of the background for Chemical Products Corporation and IP-Rome.

#### Total Background for Modeling Domain

$$\begin{aligned}
 &= (\text{Background for Chemical Products Corporation}) + (\text{Background for IP-Rome}) \\
 &= (15.4 \text{ ppb}) + (30.3 \text{ ppb}) \\
 &= \mathbf{45.7 \text{ ppb}}
 \end{aligned}$$

This background value assumes that the impacts from Chemical Products Corporation will be additive with the impacts from IP-Rome at all receptors in the domain for all hours in 2012-2014. The probability of this occurring is very small since the winds would need to perfectly align between the facilities. For this reason, we believe that the background value of 45.7 ppb will be a conservative estimate of the impacts from Chemical Products Corporation, IP-Rome, and all other smaller SO<sub>2</sub> sources in the modeling domain.

## SO<sub>2</sub> NAAQS Assessment

The total SO<sub>2</sub> concentrations were calculated as the sum of the modeled concentrations due to SO<sub>2</sub> emissions from Plant Bowen and the background SO<sub>2</sub> concentration of 45.7 ppb (119.7 µg/m<sup>3</sup>). AERMOD (version 16216r ) was used to model the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> highest three-year average of 1-hour SO<sub>2</sub> concentrations (Table 7). As seen in Figure 9, the 4<sup>th</sup> high daily maximum 1-hour SO<sub>2</sub> concentration averaged over 3-years for SO<sub>2</sub> was located at approximately 2.53 kilometers south of Plant Bowen.

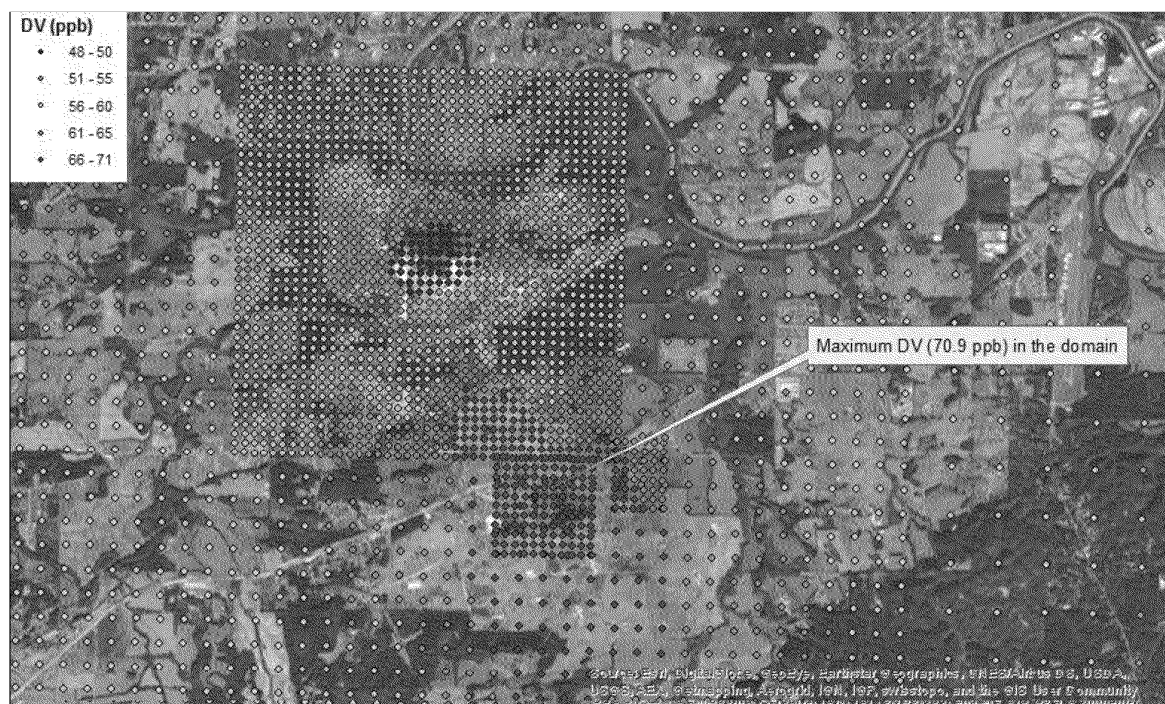
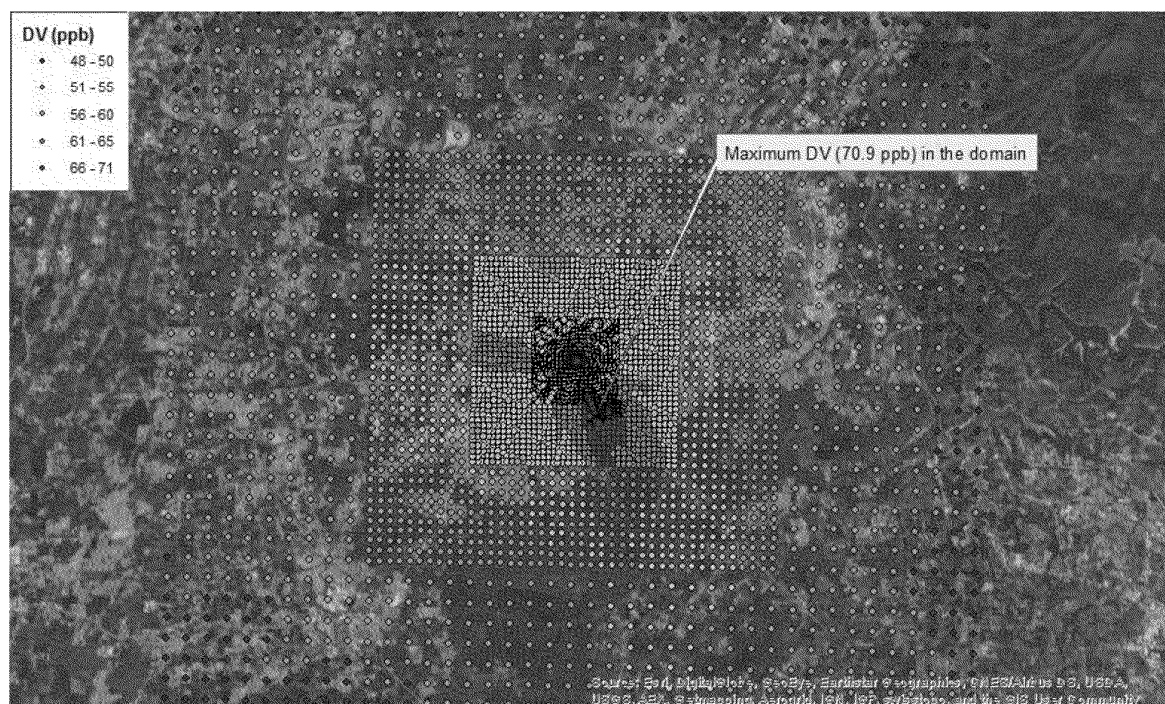
The highest 4<sup>th</sup> high 1-hour SO<sub>2</sub> concentration averaged over three years including the modeled SO<sub>2</sub> impacts from Plant Bowen (25.2 ppb = 66.1 µg/m<sup>3</sup>) and the background SO<sub>2</sub> concentration from IP-Rome and Chemical Products Corporation (45.7 ppb = 119.7 µg/m<sup>3</sup>) is 70.9 ppb (185.8 µg/m<sup>3</sup>). As shown in Table 8, this value is below the NAAQS level of 75 ppb (196 µg/m<sup>3</sup>).

**Table 7.** Summary of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> highest 1-hour SO<sub>2</sub> modeled impacts averaged over 3 years (2012-2014).

Rank	3-year Average (ppb)	2012 (ppb)	2013 (ppb)	2014 (ppb)	Receptor (lat, log)	Distance from Plant Bowen (km)
1 <sup>st</sup> High	<b>504</b>	54	1367	91	34.1389, -84.9270	1.6
2 <sup>nd</sup> High	<b>87</b>	115	60	86	34.1059, -84.9196	2.13
3 <sup>rd</sup> High	<b>75</b>	77	58	90	34.1007, -84.9090	2.95
4 <sup>th</sup> High	<b>71</b>	71	57	86	34.1044, -84.9100	2.53

**Table 8.** Summary of 1-hour SO<sub>2</sub> NAAQS analysis.

Pollutant	Averaged Period	Model Design Concentration excluding background	Monitored Background Concentration	Total Concentration	NAAQS	Below NAAQS (Y/N)
SO <sub>2</sub>	1-hour	25.2 ppb	45.7 ppb	<b>70.9 ppb</b>	75 ppb	Y
SO <sub>2</sub>	1-hour	66.1 µg/m <sup>3</sup>	119.7 µg/m <sup>3</sup>	185.8 µg/m <sup>3</sup>	196 µg/m <sup>3</sup>	Y



**Figure 9.** Spatial plot of the 4<sup>th</sup> highest daily maximum 1-hour SO<sub>2</sub> concentration averaged over 3 years.

### **Conclusion**

The Georgia Power Plant Bowen dispersion modeling for the 1-hour SO<sub>2</sub> NAAQS designations was conducted in accordance with the final Data Requirements Rule (DRR) and Modeling Technical Assistance Document (TAD) using the most recently available information. As seen in Table 8, SO<sub>2</sub> emissions from Plant Bowen do not cause or contribute to any violations of the 1-hour SO<sub>2</sub> NAAQS. This result demonstrates attainment of the 1-hour SO<sub>2</sub> NAAQS in the area surrounding the Plant Bowen.

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**Sent:** Thur 5/11/2017 10:21:11 PM  
**Subject:** FW: SC DRR Update  
[SC DRR update 5-11-2017.pdf](#)  
[WATEOModelingReportAndFiles\\_Rev4a\\_20170509.piz](#)  
[2017-05-11\\_1900-0013.6tv.pdf](#)

FYI

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**Subject:** SC DRR Update

Dear Ms. Heard,

Attached please find an update to the information SC DHEC provided on January 13, 2017 to address the Data Requirements Rule for the state of SC. The attached modeling and information is in response to EPA's decision not to approve the original modeling submitted for the SCE&G Wateree and IP Eastover facilities that used a non-default beta AERMOD option.

Please note that the attached file with the .piz extension will need to be renamed with a .zip extension and unzipped before it can be read.

Please let us know if you have any questions or need additional information.

Regards,

***John P. Glass, Jr.***

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*Atmospheric Sciences*

**Modeling Report for  
South Carolina Electric & Gas  
Wateree Station and  
International Paper  
Eastover Mill**



**Modeling Report for  
South Carolina Electric & Gas  
Wateree Station and  
International Paper  
Eastover Mill**

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## Acronyms and Abbreviations

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24/7	24 hours per day, 7 days per week
AAQS	Ambient Air Quality Standards
AFS	Air Facility System
AIG	AERMOD Implementation Guide
ASOS	Automated Surface Observing System
BAQ	Bureau of Air Quality
BPIP	Building Profile Input Program
BPIPPRIME	EPA Building Profile Input Program for PRIME
CFR	Code of Federal Regulations
DEM	Digital Elevation Model
DHEC	Department of Health and Environmental Control
DRR	Data Requirements Rule
EPA	United States Environmental Protection Agency
ESP	electrostatic precipitator
FGD	flue gas desulfurization
GEP	Good Engineering Practice
GPM	gallons per minute
g/s	grams per second
hp	horsepower
IP	International Paper
K	Kelvin
kg	kilograms
km	kilometer
kW	kilowatts
lb/hr	pounds per hour
LK	lime kiln
m	meter
µg	microgram
ug/m <sup>3</sup>	micrograms per cubic meter
MMBtu/hr	million British thermal units per hour
MW	megawatts
NAAQS	National Ambient Air Quality Standards
NCG	non-condensable gas
NED	National Elevation Dataset
NESHAP	National Emission Standards for Hazardous Air Pollutants
NLCD	National Land Cover Database
NLCD92	USGS National Land Cover Data 1992
NO <sub>2</sub>	nitrogen dioxide
PB	power boiler
ppb	parts per billion
PRIME	Plume Rise Model Enhancements
PTE	Potential to Emit
RB	recovery boiler

SCE&G	South Carolina Electric & Gas
SCR	selective catalytic reduction
SO <sub>2</sub>	sulfur dioxide
STD	smelt dissolving tank
TAD	<i>SO<sub>2</sub> NAAQS Designations Modeling Technical Assistance Document</i>
TPY	tons per year
TRS	total reduced sulfur
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTM	Universal Transverse Mercator

## Limitations

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This report summarizes work performed to date and presents the findings resulting from that work. The findings presented herein are made to a reasonable degree of scientific certainty. Exponent reserves the right to supplement this report and to expand or modify opinions based on review of additional material as it becomes available through any additional work or review of additional work performed by others.

# 1 Project Description

---

## 1.1 Purpose

This air quality modeling report, submitted to the South Carolina Department of Health & Environmental Control (DHEC) Bureau of Air Quality (BAQ), provides the procedures and results of a computer dispersion modeling demonstration for use in establishing the area attainment designation for the region surrounding Eastover, South Carolina with respect to the 1-hour National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO<sub>2</sub>). The dispersion modeling effort focuses on the area surrounding the South Carolina Electric & Gas (SCE&G) Wateree Station and the International Paper (IP) Eastover Mill, both located in Eastover, in Richland County, South Carolina.

The procedures were designed to be consistent with applicable guidance, including the August 2016 “SO<sub>2</sub> NAAQS Designations Modeling Technical Assistance Document” (TAD) issued in draft form by the United States Environmental Protection Agency (EPA). The procedures were also designed to be consistent with the final Data Requirements Rule (DRR) for the 2010 1-hour SO<sub>2</sub> primary NAAQS. This rule was published in the Federal Register on August 21, 2015<sup>1</sup> and is now codified as 40 CFR 51 Subpart BB.

The current version of the TAD references other EPA modeling guidance documents, including the following clarification memos:

- The August 23, 2010 “*Applicability of Appendix W Modeling Guidance for the 1-hour SO<sub>2</sub> National Ambient Air Quality Standard*”.
- The March 1, 2011 “*Additional Clarification Regarding Applicability of Appendix W Modeling Guidance for the 1-hour NO<sub>2</sub> National Ambient Air Quality Standard*” (hereafter referred to as the “additional clarification memo”).

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<sup>1</sup> 80 FR 51051

Although the March 1, 2011 additional clarification memo was written primarily for the 1-hour nitrogen dioxide (NO<sub>2</sub>) NAAQS, some of the guidance provided therein applies to the 1-hour SO<sub>2</sub> NAAQS after the differences in the form of the standards are taken into account. The modeling procedures also account for guidance provided by modeling staff at DHEC BAQ.

## **1.2 SCE&G Wateree Station Facility Description**

SCE&G Wateree Station is a fossil fuel-fired electric generating plant with a rated capacity of approximately 685 megawatts (MW). SCE&G Wateree Station operates under the terms and conditions of Part 70 Air Quality Permit No. TV-1900-0013 issued by DHEC BAQ. Its permitted emission units consist of:

- two main boilers,
- an auxiliary boiler,
- ash handling operations,
- coal handling operations,
- a carbon burnout plant, and
- limestone and gypsum handling operations.

The permitted emission units that emit SO<sub>2</sub> consist of the two main boilers and the auxiliary boiler. The two main boilers are wall fired units, each with a nominal rating of 3,577.5 million British thermal units per hour (MMBtu/hr). The two main boilers are permitted to fire coal, synfuel, and No. 2 fuel oil. Dedicated baghouse and selective catalytic reduction (SCR) systems control emissions from each main boiler. Emissions from the two main boilers are then exhausted to a single shared stack controlled by a flue gas desulfurization (FGD) system. Use of the FGD system is mandatory per a permit revision which went into effect on January 13, 2017. The auxiliary boiler fires No. 2 fuel oil (maximum sulfur content 0.0015% by weight), has a nominal rating of 217.9 MMBtu/hr, and does not have associated emission controls. It exhausts to a dedicated stack.

Emissions of SO<sub>2</sub> from the stack of the two main boilers and the auxiliary boiler stack are included in the modeling analysis. The current Part 70 Air Quality Permit for SCE&G Wateree Station lists the following three intermittent sources of SO<sub>2</sub>:

- 541 horsepower (hp) (400 kilowatt (kW)) power block emergency diesel generator,
- 317 hp (236 kW) emergency fire pump diesel engine, and
- 207 hp (154 kW) emergency scrubber quench water pump diesel engine.

Consistent with guidance for sources of intermittent emissions provided in the March 1, 2011 additional clarification memo, these three units were not included in the modeling since they are emergency units, operate intermittently, and do not operate continuously or frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations. Table 1 lists the intermittent and insignificant SO<sub>2</sub> sources at SCE&G Wateree Station that were not included in the modeling.

Table 1 SCE&G Wateree Station Intermittent and Insignificant SO<sub>2</sub> Sources

Unit ID	Description	2013		2014		2015	
		Annual SO <sub>2</sub> Emissions (TPY)	Operating Hours	Annual SO <sub>2</sub> Emissions (TPY)	Operating Hours	Annual SO <sub>2</sub> Emissions (TPY)	Operating Hours
IA-ENG1	541 hp (400 kW) Power Block Emergency Diesel Generator	0.017	30	0.009	17	0.009	17
IA-ENG2	317 hp (236 kW) Emergency Fire Pump Diesel Engine	0.007	22	0.007	23	0.012	38
IA-ENG3	207 hp (154 kW) Emergency Scrubber Quench Water Pump Diesel Engine	0.005	24	0.024	111	0.003	15
TOTAL		0.029		0.04		0.024	

### 1.3 IP Eastover Mill Facility Description

IP Eastover Mill is an integrated kraft pulp and paper mill. It operates under the terms and conditions of Part 70 Air Quality Permit No. TV-1900-0046 issued by DHEC BAQ. Its permitted emission units consist of the following operations:

- Woodyard,
- Pulp mill/oxygen delignification,
- Bleaching,
- Finished products,
- Recausticizing,
- Chemical recovery,
- Power boilers, and
- Miscellaneous.

Permitted sources of SO<sub>2</sub> at the IP Eastover Mill consist of two recovery furnaces, a non-condensable gas (NCG) incinerator, two lime kilns, two smelt dissolving tanks, and two fossil fuel-fired steam generating units. The emissions from these sources exhaust through seven stacks consisting of:

- dedicated stacks for each lime kiln (No. 1 LK and No. 2 LK) and each smelt dissolving tank (No. 1 SDT and No. 2 SDT),
- a stack for the second power boiler (No. 2 PB),
- a stack shared by the second recovery furnace (No. 2 RF) and the NCG incinerator, and
- a stack shared by the first recovery furnace (No. 1 RF) and the first power boiler (No. 1 PB).

The only dedicated SO<sub>2</sub> control device employed at IP Eastover Mill is the NCG Incinerator Scrubber.

Emissions of SO<sub>2</sub> from these seven stacks were included in the modeling analysis. The current Part 70 Air Quality Permit for IP Eastover Mill lists additional emission units which operate intermittently that also may emit SO<sub>2</sub>. These consist of miscellaneous portable compressors,

portable generators, portable pumps, and stationary internal combustion engines. These intermittently-operated units were not included in the modeling assessment since they do not operate continuously or frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour ambient SO<sub>2</sub> concentrations. Table 2 lists the intermittent and insignificant SO<sub>2</sub> sources at IP Eastover Mill that were not included in the modeling.

Table 2 IP Eastover Mill Intermittent and Insignificant SO<sub>2</sub> Sources

Unit ID	hp	Description	Max SO <sub>2</sub> (lb/hr)	2013		2014		2015	
				SO <sub>2</sub> TPY	Hours	SO <sub>2</sub> TPY	Hours	SO <sub>2</sub> TPY	Hours
#2 Fire Water Pump	240	Supplements electric fire water pump.	0.49	0.017	70	0.02	82.5	0.01	28.6
#3 Fire Water Pump	240	Supplements electric fire water pump.	0.49	0.019	80	0.01	35.3	0.01	29.8
#2-2 Mud Tank	22	Emergency agitation in case of power failure	0.04	0.001	28.9	0.0002	7.7	0.0001	5.4
#2-1 Mud Tank	22	Emergency agitation in case of power failure	0.04	0.001	35	0.0002	7.6	0.0001	4.9
#1 Lime Kiln Emergency Drive	22	Emergency kiln rotation in case of power failure	0.04	0.001	44.5	0.001	61.6	0.001	24.3
#2 Lime Kiln Emergency Drive	22	Emergency kiln rotation in case of power failure	0.04	0.0001	5.3	0.0001	4.3	0.001	26
Powerhouse Emergency Generator	77	Emergency power for powerhouse control room 10 kW generator	0.16	0.0001	1.0	0.0001	1.0	0.0001	1.0

\* Emissions are based on AP-42 Table 3.3-1 emission factor of 2.05 x 10<sup>-3</sup> lb/hp-hr and the rated hp of the unit.

## 1.4 Location

SCE&G Wateree Station and IP Eastover Mill are both located in Eastover, Richland County, South Carolina. The facilities are located slightly west of the Wateree River, which forms the boundary between Richland County and Sumter County, and to the east of McCords Ferry Road, also referred to as Route 601.

The facilities are situated in generally remote, rural areas with surroundings characterized by woods and fields with no nearby residences. Terrain in this area can be characterized as rolling with some nearby hills but no significant terrain features. The facilities are approximately 135 kilometers (km) northwest (inland) of the nearest coastal area. Figure 1 shows the terrain in the area surrounding the two facilities. Figure 2 shows the land use in the area. Figure 3 shows the area surrounding SCE&G Wateree Station and IP Eastover Mill. A circle with a radius of 10 km centered on a point midway between the two facilities is plotted on Figure 2 and Figure 3 to help establish scale. The distance between SCE&G Wateree Station and IP Eastover Mill is on the order of 6.7 km. Note that some of the plotted circles are terrain following, so that they may appear to have ripples.

Figure 4 shows a close up view of the area surrounding SCE&G Wateree Station, while Figure 5 shows a close up view of the area surrounding IP Eastover Mill. In each figure, a circle with a radius of 1 km centered on the facility is plotted to establish scale.

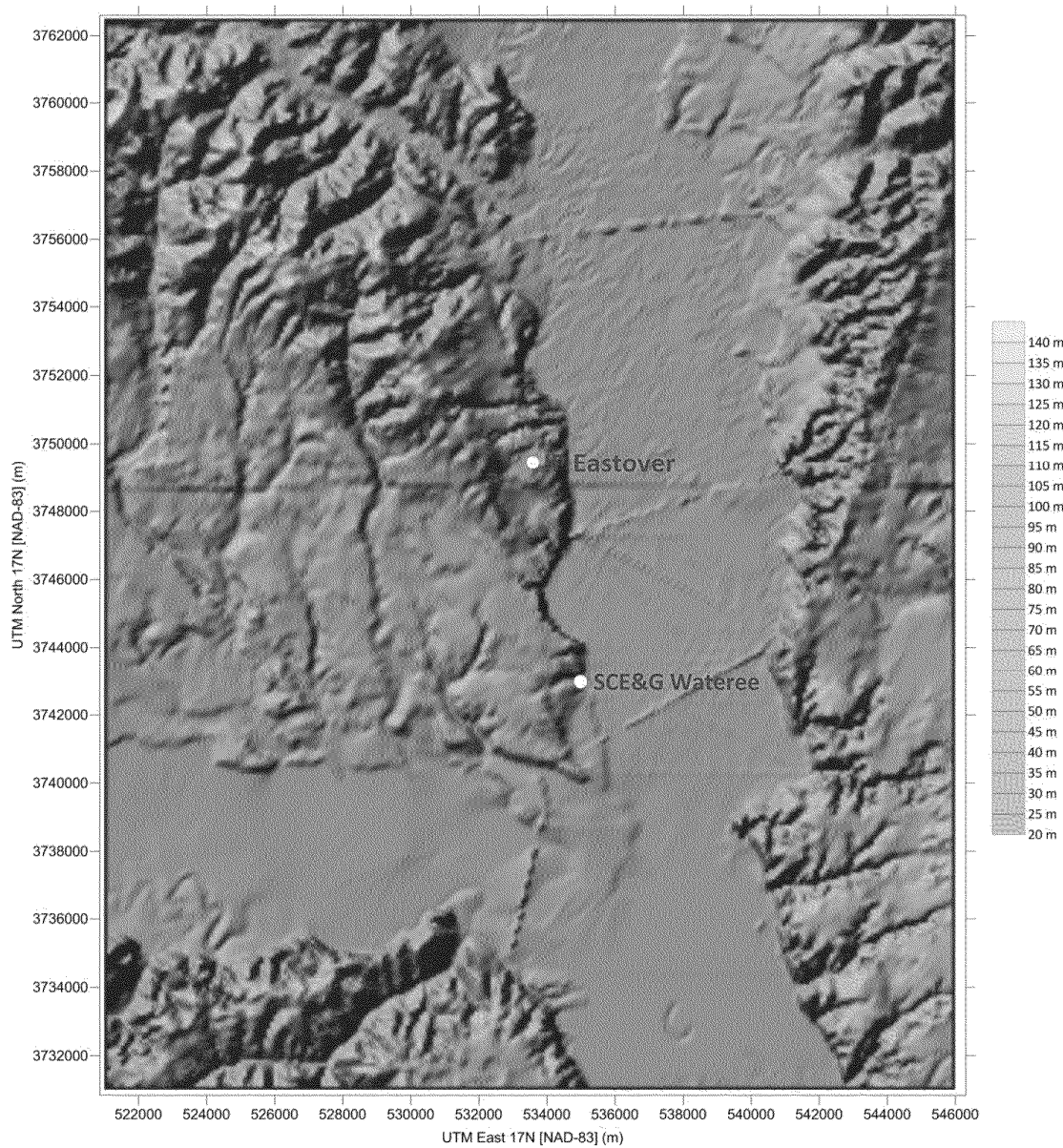
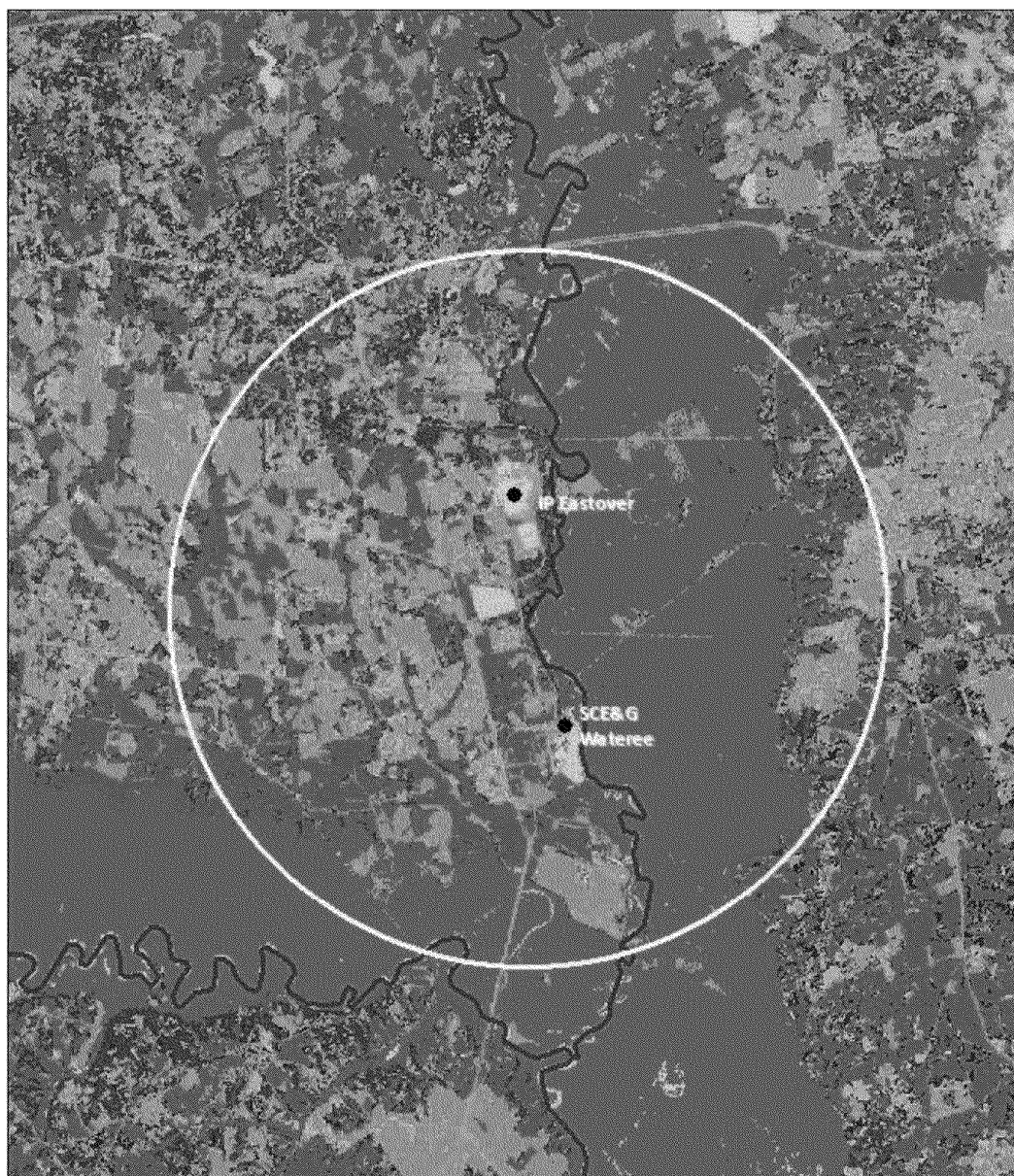


Figure 1 Terrain surrounding SCE&G Wateree Station and IP Eastover Mill



#### Land Use Classes















 Barren Land	 Developed, Low Intensity	 Mixed Forest
 Cultivated Crops	 Developed, Medium Intensity	 Open water
 Deciduous Forest	 Developed, Open Space	 Pasture/Hay
 Developed, High Intensity	 Emergent Herbaceous Wetland	 Scrub/Shrub
	 Evergreen Forest	 Woody Wetlands

Figure 2 Land use surrounding SCE&G Wateree Station and IP Eastover Mill with 10 km radius circle



Figure 3      Area surrounding SCE&G Wateree Station and IP Eastover Mill with 10 km radius circle



Figure 4 Area surrounding SCE&G Wateree Station with 1 km radius circle



Figure 5 Area surrounding IP Eastover Mill with 1 km radius circle

## 1.5 Nearby Facilities

The EPA EnviroMapper<sup>2</sup> web interface was used to help identify stationary sources of air emissions located near SCE&G Wateree Station and IP Eastover Mill. EnviroMapper is linked to EPA's Air Facility System (AFS), which contains emissions and compliance information on stationary air pollution point sources regulated by EPA, state, and local air regulatory agencies. Searches were conducted to identify point sources located within 5 miles of either facility.

The following nearby facilities were identified:

- Kemira/Finnchem 200 Wateree Station Road, a sodium chlorate production facility,
- Kemira/Fennchem 191 Wateree Station Road, a facility that conducts anode coating and metal etching processes,
- Glasscock Company Plant 4, a ready-mix concrete manufacturing facility, and
- Specialty Minerals Inc., a facility that manufactures calcium carbonate and which is collocated at IP Eastover Mill.

Figure 6 shows the approximate location (based on coordinates in AFS) of these nearby facilities relative to SCE&G Wateree Station and IP Eastover Mill. Circles with radii of 1 km and 3 km surrounding each primary facility are also plotted to help establish scale.

Glasscock Company Plant 4 is a minor facility and does not emit SO<sub>2</sub>. Therefore, it was eliminated from further consideration. The Kemira facility at 191 Wateree Station Road has no permitted sources of SO<sub>2</sub> emissions and was also eliminated from further consideration.

The Kemira facility at 200 Wateree Station Road accepted a sulfur in oil limit (0.05%) in its Conditional Major Permit to avoid being a major source. The resulting potential to emit from its boilers is 4.98 pounds per hour (lb/hr) or 21.8 tons per year (TPY) on an annual basis. This facility was retained for further consideration.

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<sup>2</sup> <http://www.epa.gov/emefdata/em4ef.home>

The Specialty Minerals, Inc. facility is physically located contiguous to the IP Eastover Mill and produces precipitated calcium carbonate for use in IP's papermaking process. The resulting potential to emit from its carbonators is 2.49 lb/hr (10.91 TPY) on an annual basis. This facility was retained for further consideration.



Figure 6 Nearby facilities to SCE&G Wateree Station and IP Eastover Mill with 1 km and 3 km radius circles

## 2 Model Selection

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AERMOD Version 16216r was used for the cumulative impact analysis for determining the appropriate attainment designation of the area surrounding SCE&G Wateree Station and IP Eastover Mill with respect to the 1-hour NAAQS for SO<sub>2</sub>. AERMOD is recommended in the EPA “*Guideline on Air Quality Models*” for a wide range of near-field applications in all types of terrain. In addition, AERMOD contains the PRIME building downwash algorithm, which accounts for aerodynamic building downwash effects. AERMOD was run using current regulatory default options to model all sources.

The air quality dispersion modeling analyses account for potential aerodynamic building downwash effects for all modeled stacks at SCE&G Wateree Station and IP Eastover Mill. Building parameters needed by AERMOD to model potential building downwash effects were obtained using the latest version (04274) of the EPA Building Profile Input Program for PRIME (BPIPPRIME).

## 3 Modeling Domain

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### 3.1 Determination of Sources to Include

#### 3.1.1 Primary Sources

The modeling domain for the Eastover, SC SO<sub>2</sub> attainment area designation modeling analysis focuses on the two primary facilities that are the main subject of this modeling report, namely SCE&G Wateree Station and IP Eastover Mill. Under the DRR, a source subject to its requirements (i.e., an “applicable source”) is one with actual SO<sub>2</sub> emissions of 2,000 TPY or more or otherwise identified by an air agency as requiring air quality characterization.<sup>3</sup> These two facilities were identified by DHEC BAQ as having actual SO<sub>2</sub> emissions for the most recent calendar year in excess of 2,000 TPY and thus are large enough to require modeling to help establish the attainment status of the surrounding area with respect to the 1-hour NAAQS for SO<sub>2</sub>. At the request of DHEC BAQ, this report was prepared for a joint modeling analysis inclusive of both facilities.

#### 3.1.2 Nearby Sources

The procedures used in identifying other secondary facilities to include explicitly in the dispersion modeling analysis are described below, along with sources excluded from the area designation modeling.

Current modeling guidance in the TAD states that the process of determining which nearby sources to include in the attainment area designation modeling should make use of professional judgment. Guidance in the TAD and in the referenced clarification memos states that the “*number of sources to explicitly model should generally be small.*”<sup>4</sup>

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<sup>3</sup> In this report, the term “principal source” is used in place of “applicable source” to provide further clarity in distinguishing the applicable sources to the additional sources (“nearby” or “background” sources) that were considered for inclusion in the cumulative impact analysis.

<sup>4</sup> U.S. EPA (2013) p.7

The applicable guidance in the TAD and clarification memos also mentions that any nearby sources that are expected to cause a significant concentration gradient in the vicinity of the primary sources being modeled should be included in the area designation modeling and that the impacts of any other sources should be incorporated via a consideration of background air quality concentrations.

Although some regulatory agencies have informally established minimum source emission rate thresholds below which nearby sources do not need to be explicitly included in the area designation modeling, neither EPA nor DHEC BAQ has yet done so. Consequently, a variety of considerations and technical justifications were used to select the background sources included in the cumulative impact analysis.

### **3.1.3 Screening Area**

For the modeling, a screening area extending 50 km from each of the two primary sources was used to identify other potential nearby sources for inclusion in the analysis. Sources beyond 50 km are very unlikely to cause or contribute to a violation of the NAAQS in the vicinity of the primary sources or to cause a significant concentration gradient in the vicinity of the primary sources.

### **3.1.4 Screening Procedures – Initial Consideration of Emissions and Proximity**

Actual emission rates (when available) and proximity to the primary sources were factors that were considered for including or excluding potential nearby sources within the screening area. Actual emission rates are appropriate for use in determining sources to include or exclude because of the focus of the area designation modeling, i.e., on estimating concentrations that would be actually measured at ambient air quality monitors.

Proximity to the primary sources is also a factor to consider for several reasons. First, the farther away a candidate source is from the primary sources, the less likely it is that the candidate source would have a significant contribution to a predicted violation of the NAAQS

due to the primary sources (or that the primary sources would have a significant contribution to predicted violations caused by the candidate source). In addition, in the additional clarification memo, EPA references a general “rule of thumb” that the distance to a maximum 1-hour predicted impact is typically on the order of 10 times the stack height and that the region of significant concentration gradients in flat terrain is on the same scale. Finally, EPA states that the process of identifying nearby sources to include in a cumulative impact analysis “*should focus on the area within about 10 kilometers of the project location in most cases*” and that the “*routine inclusion of all sources within 50 kilometers...is likely to produce an overly conservative result in most cases.*”<sup>5</sup>

DHEC BAQ provided county-by-county spreadsheets listing current allowable annual emissions for all facilities with air permits. Initial screening was conducted using these data to ensure that all facilities with current air permits would be considered. These data were first processed to identify the facilities that are located within 50 km of either Wateree Station or the Eastover Mill. These facilities are shown in Figure 7.

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<sup>5</sup> [http://www.epa.gov/ttn/scram/guidance/clarification/Additional\\_Clarifications\\_AppendixW\\_Hourly-NO2-NAAQS\\_FINAL\\_03-01-2011.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/Additional_Clarifications_AppendixW_Hourly-NO2-NAAQS_FINAL_03-01-2011.pdf) p.16

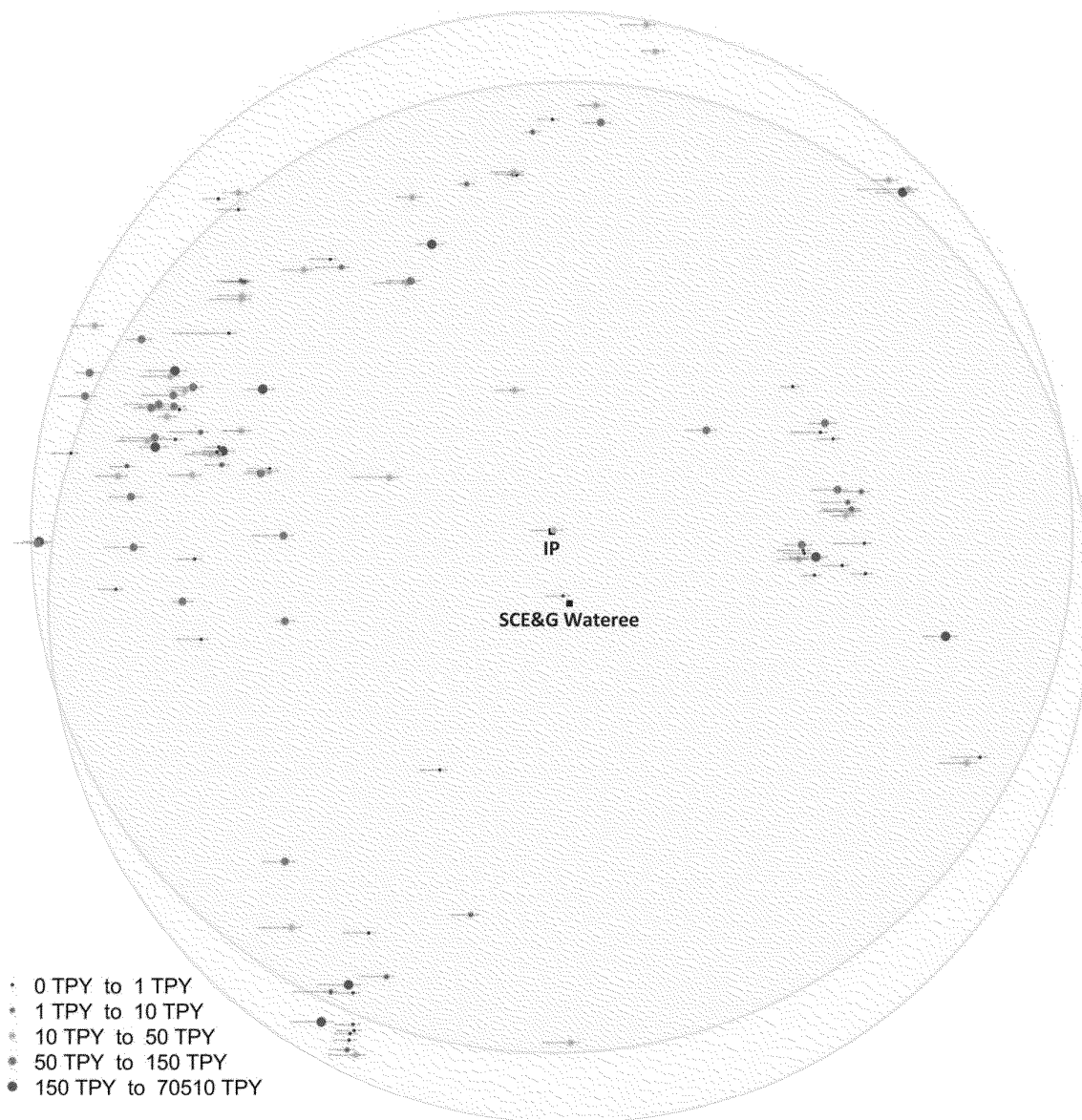


Figure 7 All permitted facilities within 50 km of IP Eastover Mill and SCE&G Wateree

Figure 7 shows that most of the nearby facilities that are candidates for inclusion in the modeling analysis are relatively distant from the primary sources, and some are only within the screening area for one of the two primary sources. Although distance is one factor to consider when selecting sources, the magnitude of their SO<sub>2</sub> emission rates is another.

While the background source screening analysis presented here was performed for 2012-2014, it is assumed that the conclusions from 2012-2014 can also be generally applied for the modeled period 2014-2016.

Actual annual SO<sub>2</sub> emission rates for the years 2012, 2013, and 2014 were obtained from DHEC BAQ for each of the candidate nearby facilities. Figure 8 shows the candidate sources with 2014 emissions greater than 1 TPY and is coded to reflect the actual annual facility-wide emission rate in 2014. The primary sources, each of which has actual annual SO<sub>2</sub> emission rates exceeding 2,000 TPY, are denoted by the large white circles. Invista SARL (Invista) and CMC Steel South Carolina, whose actual annual SO<sub>2</sub> emission rates were between 100 TPY and 1,000 TPY, are depicted by smaller purple circles. Sources with actual annual SO<sub>2</sub> emission rates greater than 10 TPY but less than 100 TPY are depicted by smaller blue circles. Finally, sources with actual annual SO<sub>2</sub> emission rates greater than 1 TPY but less than 10 TPY are depicted by still smaller yellow circles.

Figure 8 shows that the candidate nearby sources with the largest annual SO<sub>2</sub> emission rates, such as Invista and CMC Steel South Carolina, are located in the outer regions of the 50 km screening area.

Figure 9 is a pie chart showing the relative actual SO<sub>2</sub> emissions in 2014 from sources within the screening area. Approximately 92% of the SO<sub>2</sub> emissions are from the two primary sources, SCE&G Wateree Station (~57%) and IP Eastover Mill (~35%). Actual emissions were not available for two nearby facilities discussed earlier, Specialty Minerals, Inc. and Kemira. Consequently, their potential to emit for SO<sub>2</sub> was used instead in constructing the pie chart.

Figure 10 and Figure 11 show the regions within 20 km of SCE&G Wateree Station and IP Eastover Mill, respectively. In each figure, circles with radii of 10 km and 20 km from the primary source are plotted along with locations of nearby sources that had actual emissions exceeding 1 TPY for SO<sub>2</sub>. There are no such sources within 20 km of Wateree Station. The only such source within 20 km of IP Eastover Mill is Northeast Landfill, a fairly small source of SO<sub>2</sub>. Figure 10 and Figure 11 do not show the locations of Specialty Minerals, Inc. or Kemira (Finnechem USA). These site locations are shown in Figure 6.

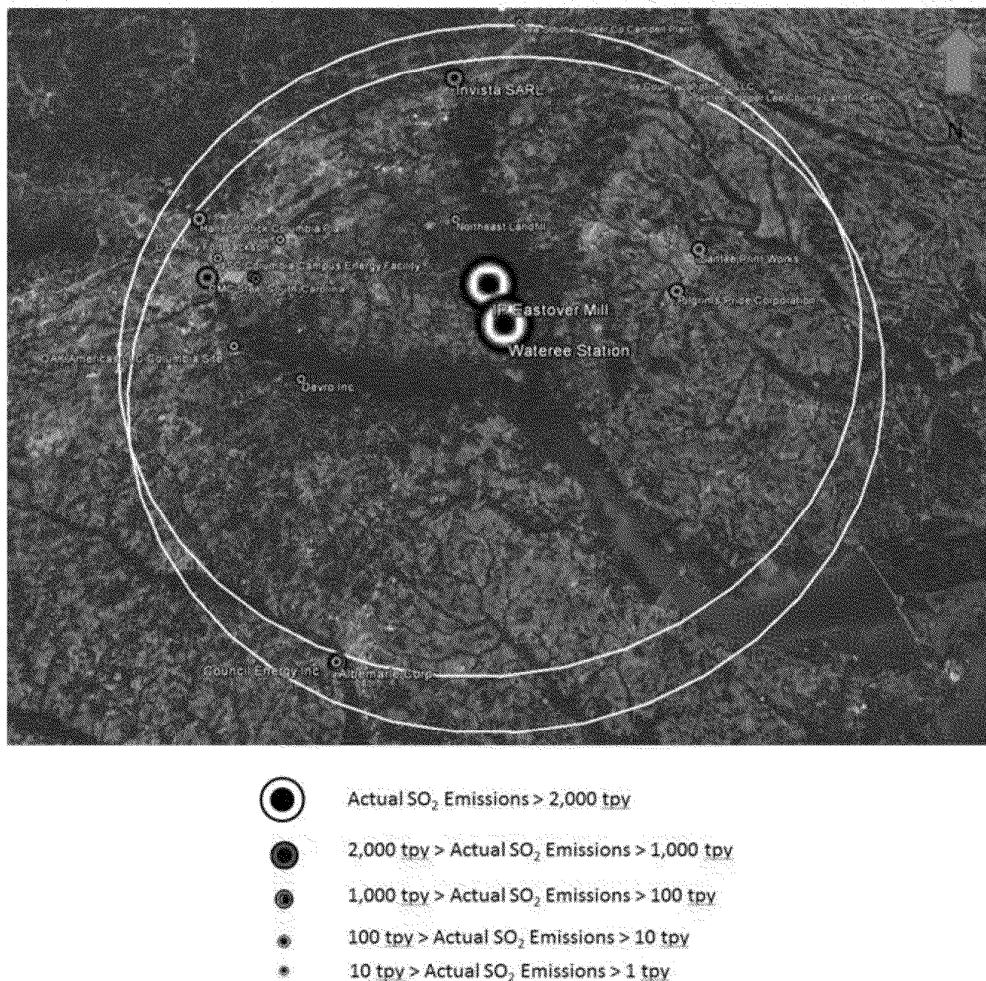


Figure 8 Candidate sources with emissions greater than 1 TPY located within 50 km of the primary sources

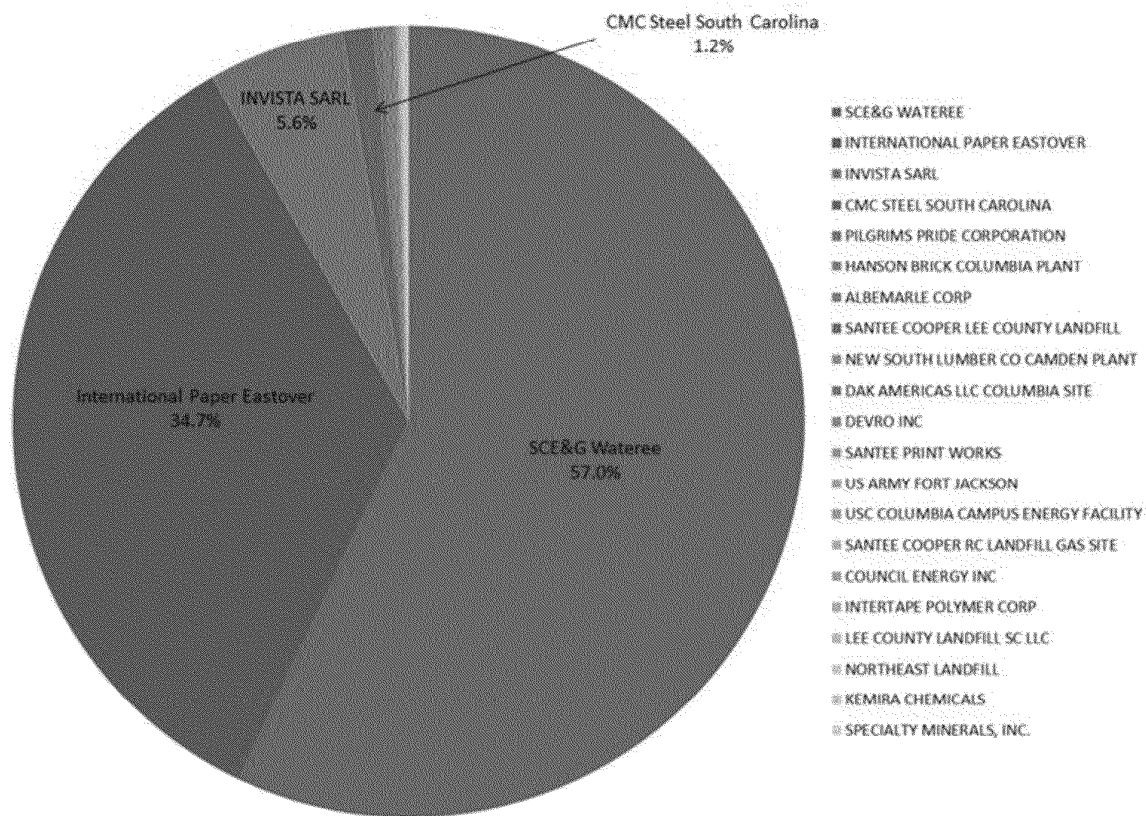


Figure 9 Relative 2014 SO<sub>2</sub> emissions for sources greater than 1 TPY within screening area



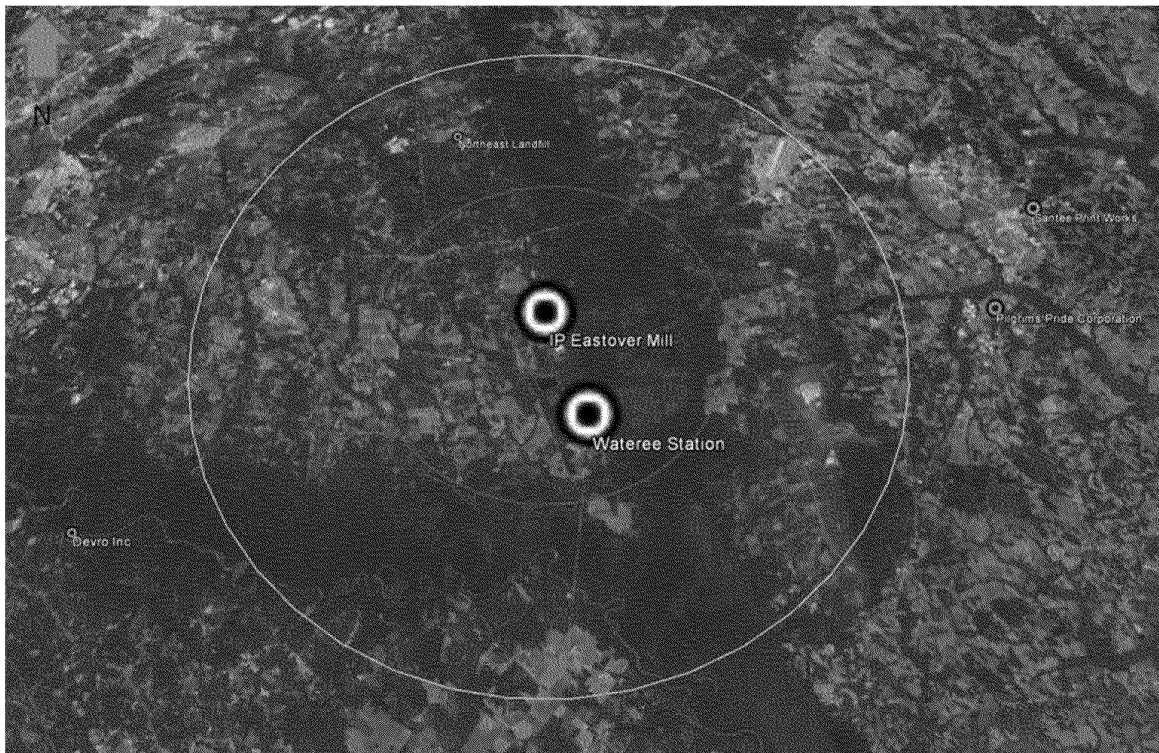


Figure 11 Sources nearest to IP Eastover Mill (10 km and 20 km radius circles)

### 3.1.5 20D Methodology

Although the initial consideration of emission rates and proximity to the primary sources suggested that few, if any, nearby sources need to be included in the cumulative impact analysis, an objective method was used to exclude some of the sources within the screening area.

A method commonly used and recommended by DHEC BAQ for screening nearby sources for inclusion in a cumulative impact analysis is the “20D” methodology. Originally developed by the North Carolina Department of Environment and Natural Resources, the 20D method allows for candidate nearby sources to be excluded from a cumulative analysis if their facility-wide emission rates, in tons per year, are less than 20D, where D is the distance in km between the candidate nearby source and the primary source. The 20D method was used with facility-wide annual emission rates from 2014 for each candidate source.

Although actual annual emission rates from 2014 were ultimately used in the 20D screening of sources, an initial 20D screening analysis was conducted using current allowable annual emissions provided by DHEC BAQ for facilities with air permits in each county. This initial screening was conducted to ensure that all facilities with current air permits would be considered.

The distances from each off-site facility to Wateree Station and to IP Eastover were calculated, and any facilities more than 50 km from both Wateree Station and IP Eastover were eliminated from further consideration. Table 3 lists all permitted sources within 50 km of either Wateree Station or IP Eastover, allowable annual SO<sub>2</sub> emissions in TPY, the calculated distances from the two principal sources, and the results of the initial 20D screening analyses. All permitted facilities within 50 km of either of the two principal sources are shown in Figure 7.

Next, the 20D methodology using annual allowable emissions was used to determine which facilities to exclude from the cumulative impact analysis. As shown in Table 3, all but six facilities (not including Wateree Station and IP Eastover) were excluded based on annual allowable emissions.

For four of the remaining sources (Santee Printworks, DAK, Columbia Energy Center, and SCE&G Coit), actual annual SO<sub>2</sub> emissions were obtained from information provided by DHEC BAQ. The 20D analysis was then repeated for the remaining facilities using actual annual SO<sub>2</sub> emissions from 2014. Emissions from 2014 are most representative of current operations. The results in Table 3 show that if actual annual facility-wide SO<sub>2</sub> emissions for 2014 are used in the 20D calculations, these four sources can be excluded from the cumulative impact analysis.

Actual annual emissions were not available for two sources, Specialty Minerals, Inc. and Kemira Chemicals.

Specialty Minerals, Inc. is collocated with IP Eastover Mill and will be included in the cumulative impact analysis.

Kemira Chemicals comes close to screening out with 20D when using allowable SO<sub>2</sub> emissions ( $20D = 20.2 < 21.81$  TPY) which are based on a sulfur in oil limit of 0.05%. However, information provided by DHEC BAQ indicates that Kemira Chemicals is firing ultra-low sulfur diesel with a maximum sulfur content of 15 ppm (0.0015%). If the calculations are revised to account for the actual fuel used, the resulting actual SO<sub>2</sub> emission rate of 0.727 TPY allows Kemira Chemicals to screen out with 20D. Therefore, Kemira Chemicals was excluded from the cumulative impact analysis.

Table 3 Summary of 20D Screening Analysis

Company Name	Permit #	County Name	Allowable SO <sub>2</sub> TPY	UTM-17N (NAD83) East (m)	UTM-17N (NAD83) North (m)	Distance from IP (km)	Distance from SCE&G IP (km)	20D for IP	20D for SCE&G	Based on Allowable Emissions				Based on 2014 Actual Emissions			
										EXCLUDE for IP		EXCLUDE for SCE&G		EXCLUDE for IP		EXCLUDE for SCE&G	
										2012 Actual SO <sub>2</sub> TPY	2013 Actual SO <sub>2</sub> TPY	2014 Actual SO <sub>2</sub> TPY	2012 Actual SO <sub>2</sub> TPY	2013 Actual SO <sub>2</sub> TPY	2014 Actual SO <sub>2</sub> TPY	2012 Actual SO <sub>2</sub> TPY	2013 Actual SO <sub>2</sub> TPY
SCE&G Wateree	1900-0013	Richland	70,509.24	534978.0	3742833.5	7.0	0.0	140.7	0.0	NO	NO	NO	3531.43	5548.07	6550.28	NO	NO
International Paper - Eastover	1900-0046	Richland	15,279.63	533448.1	3749698.7	0.0	7.0	0.0	140.7	NO	NO	NO	3737.48	3373.68	3315.23	NO	NO
Specialty Minerals, Inc.	1900-0145	Richland	10.91	533447.4	3749913.2	0.2	7.2	4.3	144.9	NO	YES	YES	N/A	N/A	N/A	N/A	N/A
Santee Pint Works	2140-0003	Sumter	2,663.42	562763.5	3753793.2	29.6	29.9	592.0	597.4	NO	NO	NO	0.17	4.70	32.82	YES	YES
DAK	0460-0029	Calhoun	2,663.18	499024.9	3747188.1	34.5	36.2	690.3	724.3	NO	NO	NO	2.61	6.84	5.47	YES	YES
Columbia Energy Center	0460-0024	Calhoun	1,190.05	498364.8	3747719.9	35.1	36.9	702.8	738.8	NO	NO	NO	0.76	2.05	2.00	YES	YES
SCE&G Coit	1900-0132	Richland	1,150.63	495450.0	3757210.0	38.7	42.1	774.7	841.2	NO	NO	NO	0.14	0.14	0.05	YES	YES
Kemira Chemicals	1900-0172	Richland	21.81	534356.4	3743627.2	6.1	1.0	122.8	20.2	YES	YES	NO	0.727			YES	YES
Trinity Industries, Inc.	0460-0023	Calhoun	0.02	522535.0	3726867.0	25.3	20.2	506.1	404.8	YES	YES	YES					
SC Air National Guard-McEntire Joint NGB	1900-0250	Richland	10.21	517688.0	3754987.0	16.6	21.1	332.5	422.7	YES	YES	YES					
Northeast Landfill	1900-0178	Richland	23.70	529700.0	3763388.0	14.2	21.2	283.9	424.4	YES	YES	YES					
Shaw Air Force Base	2140-0004	Sumter	97.60	548122.2	3756592.4	17.7	21.3	354.0	426.0	YES	YES	YES					
EMS Givory America	2140-0054	Sumter	46.16	556961.2	3747135.2	23.7	22.4	473.0	448.0	YES	YES	YES					
Klin Direct, Inc.	2140-0142	Sumter	75.78	557257.0	3748537.2	23.8	23.0	476.7	460.0	YES	YES	YES					
International Paper - Sumter	2140-0102	Sumter	0.04	557416.5	3747991.2	24.0	23.0	480.6	460.5	YES	YES	YES					
Textilease Corporation	2140-0117	Sumter	0.33	557488.5	3747701.2	24.1	23.0	482.5	460.6	YES	YES	YES					
Cooper Tools	2140-0022	Sumter	0.03	558462.0	3745602.0	25.3	23.6	506.9	472.9	YES	YES	YES					

Table 3 (Cont'd.)      Summary of 20D Screening Analysis

Company Name	Permit #	County Name	Allowable SO <sub>2</sub> TPY	UTM-17N (NAD83) East (m)	UTM-17N (NAD83) North (m)	Distance from IP (km)	Distance from SCE&G IP (km)	20D for SCE&G IP	20D for SCE&G IP	Based on Allowable Emissions				Based on 2014 Actual Emissions			
										2012		2013		2014		EXCLUDE for IP	
										Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	EXCLUDE for IP	EXCLUDE for SCE&G
Sunter Heat & Power, LLC	2140-0149	Sumter	2.32	558576.0	3747209.0	25.3	24.0	505.0	480.0	YES	YES						
Pilgrims Pride Corporation	2140-0006	Sumter	374.45	558608.7	3747373.0	25.3	24.1	505.4	481.3	YES	YES						
Peace Textile America	2140-0110	Sumter	0.56	561131.0	3746550.0	27.9	26.4	557.2	528.3	YES	YES						
Devro	0460-0003	Calhoun	99.18	507652.0	3741223.2	27.2	27.4	543.1	547.5	YES	YES						
Carolina Filters	2140-0111	Sumter	18.88	561504.0	3751316.0	28.1	27.8	562.0	557.0	YES	YES						
Tuomey Regional Medical	2140-0050	Sumter	56.68	560697.0	3753809.0	27.6	28.0	551.1	559.3	YES	YES						
Westinghouse Electric Company	1900-0050	Richland	86.00	507506.2	3749420.2	25.9	28.3	518.9	565.0	YES	YES						
Carolina Furniture Works, Inc	2140-0014	Sumter	3.93	561675.3	3752603.0	28.4	28.4	567.5	568.6	YES	YES						
Florence Concrete Products	2140-0061	Sumter	25.99	562020.0	3751752.0	28.6	28.5	572.9	569.5	YES	YES						
Nova Molecular Technologies, Inc.	2140-0150	Sumter	35.46	562048.0	3751753.0	28.7	28.5	573.5	570.0	YES	YES						
City of Sumter	2140-0118	Sumter	0.04	563360.0	3745756.0	30.2	28.5	603.4	570.6	YES	YES						
Giant Resource Recovery (GRR)	2140-0038	Sumter	4.82	562065.5	3751962.2	28.7	28.6	574.1	571.7	YES	YES						
Continental Tire the Americas, LLC	2140-0147	Sumter	0.35	563261.0	3748673.0	29.8	28.9	596.6	577.6	YES	YES						
Caterpillar Precision Pin Products	2140-0125	Sumter	0.01	559070.0	3756371.3	27.4	29.2	547.7	584.4	YES	YES						
Becton-Dickinson	2140-0018	Sumter	0.04	560258.0	3758749.0	28.3	29.9	565.9	597.5	YES	YES						
Garnay, Inc.	2140-0060	Sumter	0.00	556402.0	3763723.0	26.9	29.9	538.0	598.5	YES	YES						
Madison Industries	2140-0047	Sumter	2.32	563001.0	3753630.0	29.8	30.0	596.3	600.6	YES	YES						

Table 3 (Cont'd.)      Summary of 20D Screening Analysis

Company Name	Permit #	County Name	Allowable SO <sub>2</sub> TPY	UTM-17N (NAD83) East (m)	UTM-17N (NAD83) North (m)	Distance from IP (km)	Distance from SCE&G IP (km)	20D for IP SCE&G	20D for IP SCE&G	Based on Allowable Emissions				Based on 2014 Actual Emissions			
										2012		2013		2014		EXCLUDE for IP	
										Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	Actual SO <sub>2</sub> TPY	EXCLUDE for IP	EXCLUDE for IP
CR Jackson Inc	9900-0254	PORTABLE	101.62	559517.0	3760234.0	28.1	30.1	562.3	601.6	YES	YES						
CameronLumber Co	0460-0001	Calhoun	1.76	525501.0	3712935.0	37.6	31.4	752.3	627.3	YES	YES						
American-Italian Pasta	1900-0130	Richland	46.25	506130.0	3755590.0	27.9	31.5	558.9	630.9	YES	YES						
MARS PETCARE US, INC.	1900-0083	Richland	0.96	506217.7	3755888.3	27.9	31.6	558.5	631.7	YES	YES						
Jushi (USA), Ltd.	1900-0284	Richland	86.90	505334.7	3755382.3	28.7	32.2	573.6	643.8	YES	YES						
Santee Cooper Richland Co. Landfill	1900-0224	Richland	12.91	519338.5	3773606.8	27.8	34.5	555.2	690.4	YES	YES						
Richland County Landfill	1900-0148	Richland	94.83	519723.0	3773825.0	27.8	34.5	555.1	690.9	YES	YES						
Starbucks Coffee Company	0460-0027	Calhoun	0.20	499610.7	3739491.3	35.3	35.5	706.9	710.5	YES	YES						
WJBD VA Hospital	1900-0023	Richland	19.97	503456.9	3759519.5	31.6	35.7	631.2	713.3	YES	YES						
Fort Jackson	1900-0016	Richland	504.88	505531.6	3763477.0	31.1	36.0	622.6	719.2	YES	YES						
Hospital Services	1900-0100	Richland	1.45	501599.0	3756274.5	32.5	36.0	650.4	719.7	YES	YES						
Grant Clarendon, Inc	0680-0046	Clarendon	247.04	571067.4	3739758.8	38.9	36.2	778.2	724.4	YES	YES						
Eastman Chemical	0460-0030	Calhoun	0.26	498996.1	3747157.2	34.5	36.2	690.9	724.8	YES	YES						
Anchor Continental	1900-0033	Richland	365.25	501695.8	3757600.6	32.7	36.4	654.4	728.2	YES	YES						
Waste 2 Energy	1900-0263	Richland	12.88	501296.0	3757291.5	33.0	36.7	660.7	733.1	YES	YES						
REA Construction Co	9900-0088	PORTABLE	76.21	507641.0	3718105.0	40.8	36.9	815.9	737.2	YES	YES						
S.M.-Owens Steel Company	1900-0176	Richland	0.00	501119.7	3757491.8	33.3	36.9	665.1	737.9	YES	YES						

Table 3 (Cont'd.) Summary of 20D Screening Analysis

Company Name	Permit #	County Name	Allowable SO <sub>2</sub> TPY	UTM-17N (NAD83) East (m)	UTM-17N (NAD83) North (m)	Distance from IP (km)	Based on Allowable Emissions						Based on 2014 Actual Emissions					
							Distance from		20D for		EXCLUDE for		2012 Actual SO <sub>2</sub> TPY		2013 Actual SO <sub>2</sub> TPY		2014 Actual SO <sub>2</sub> TPY	
							IP	SCE&G (km)	IP	SCE&G	IP	SCE&G	IP	SCE&G	IP	SCE&G	IP	SCE&G
Sea Hunt Boats	1900-0234	Richland	0.04	501320.0	3757960.0	33.2	36.9	663.5	738.0	YES	YES	YES						
Welchem US	1380-0017	Kershaw	184.57	521759.3	3777410.7	30.1	37.0	601.5	740.4	YES	YES	YES						
The Regional Medical Center	1860-0063	Orangeburg	0.53	515723.2	3711213.0	42.4	37.0	847.4	740.4	YES	YES	YES						
Carben	9900-0447	PORTABLE	76.21	497844.0	3743087.0	36.2	37.1	724.3	742.7	YES	YES	YES						
IBP Carolina Cooled Meats	1900-0144	Richland	23.54	500566.2	3757274.3	33.8	37.3	675.1	746.6	YES	YES	YES						
City of Columbia WWTP	1900-0021	Richland	12.70	498722.5	3755202.0	35.2	38.3	703.2	766.1	YES	YES	YES						
Clemson Univ. Livestock Lab	1900-0048	Richland	6.92	513082.2	3776527.4	32.6	39.0	651.4	780.1	YES	YES	YES						
Associated Asphaltis Columbia, LLC	9900-0025	PORTABLE	6.26	499599.0	3759400.0	35.3	39.1	705.0	782.0	YES	YES	YES						
Husquama Outdoor Products	1860-0043	Orangeburg	2.16	517380.3	3707046.3	45.6	39.9	911.6	797.6	YES	YES	YES						
FN Manufacturing, Inc.	1900-0052	Richland	0.20	512027.5	3775896.5	33.8	40.2	676.8	805.0	YES	YES	YES						
Carolina Ceramics, Inc.	1900-0007	Richland	19.99	509448.6	3774857.1	34.8	41.0	695.4	819.1	YES	YES	YES						
Orangeburg Dept. of Public Utilities	1860-0073	Orangeburg	34.43	508301.0	3711707.0	45.6	41.0	911.2	819.9	YES	YES	YES						
Consolidated Systems Inc	1900-0040	Richland	0.14	497152.3	3756716.3	37.4	41.0	748.0	820.5	YES	YES	YES						
Clarendon Memorial Hospital	0680-0024	Clarendon	18.92	573123.0	3727549.5	45.4	41.1	908.8	821.9	YES	YES	YES						
Shawmut	1380-0073	Kershaw	0.01	529884.0	3784042.0	34.5	41.5	690.6	830.4	YES	YES	YES						
Unitrin	1380-0016	Kershaw	1.89	525100.0	3783180.0	34.5	41.5	690.1	830.8	YES	YES	YES						
PowerSecure, Inc.	1380-0062	Kershaw	4.16	529538.0	3784117.0	34.6	41.6	692.8	832.8	YES	YES	YES						

Table 3 (Cont'd.)      Summary of 20D Screening Analysis

Company Name	Permit #	County Name	Allowable SO <sub>2</sub> TPY	UTM-17N (NAD83) East (m)	UTM-17N (NAD83) North (m)	Distance from IP (km)	Distance from SCE&G IP (km)	20D for SCE&G IP	20D for SCE&G IP	Based on Allowable Emissions				Based on 2014 Actual Emissions			
										2012 Actual SO <sub>2</sub> TPY		2013 Actual SO <sub>2</sub> TPY		2014 Actual SO <sub>2</sub> TPY		EXCLUDE for IP	
										EXCLUDE for IP	EXCLUDE for SCE&G	EXCLUDE for IP	EXCLUDE for SCE&G	EXCLUDE for IP	EXCLUDE for SCE&G	EXCLUDE for IP	EXCLUDE for SCE&G
Providence Hospital	1900-0061	Richland	69.69	498817.1	3763689.3	37.4	41.7	747.0	834.9	YES	YES						
Jarden Applied Materials (Formerly Shakespeare Monofilament)	1900-0036	Richland	0.03	502282.0	3768819.0	36.6	41.8	731.3	835.3	YES	YES						
Kawashima Textile USA	1380-0048	Kershaw	12.87	529638.0	3784321.0	34.8	41.8	696.6	836.6	YES	YES						
USC Central Energy Facilities	1900-0143	Richland	0.65	497549.7	3761555.9	37.8	41.8	756.1	837.0	YES	YES						
HBD Industries	1380-0018	Kershaw	46.43	519881.3	3781913.4	35.0	41.9	699.1	837.9	YES	YES						
Southwoods Lumber & Millwork	0680-0005	Clarendon	0.57	574369.0	3728097.0	46.3	42.1	925.5	841.1	YES	YES						
Orangeburg County Biomass	1860-0123	Orangeburg	11.52	535055.0	3700750.0	49.0	42.1	979.5	841.7	YES	YES						
Lanier Construction Company	9900-0035	PORTABLE	67.45	493137.0	3748295.0	40.3	42.2	806.7	843.9	YES	YES						
Benedict College	1900-0211	Richland	26.02	498042.1	3763372.3	38.0	42.3	759.1	845.2	YES	YES						
South Carolina State University	1860-0065	Orangeburg	279.40	513786.0	3706257.0	47.7	42.3	953.7	845.4	YES	YES						
Office of General Services energy fac.	1900-0162	Richland	131.05	497000.0	3761842.0	38.4	42.5	768.4	849.4	YES	YES						
CMC Steel SC	1560-0087	Lexington	317.02	495229.9	3757965.9	39.1	42.5	782.0	850.6	YES	YES						
ALSCO	1900-0239	Richland	27.99	496331.0	3760863.0	38.8	42.6	775.2	852.9	YES	YES						
Cactus Family Farms	1860-0007	Orangeburg	0.04	514190.0	3705481.0	48.2	42.7	964.6	855.0	YES	YES						
Sloan Construction Company-Cayce	9900-0060	PORTABLE	76.21	495154.0	3758872.0	39.4	42.9	787.6	858.6	YES	YES						

Table 3 (Cont'd.) Summary of 20D Screening Analysis

Company Name	Permit #	County Name	Allowable SO <sub>2</sub> TPY	UTM-17N (NAD83) East (m)	UTM-17N (NAD83) North (m)	Distance from IP (km)	Distance from SCE&G IP (km)	20D for SCE&G IP	20D for SCE&G IP	Based on Allowable Emissions				Based on 2014 Actual Emissions			
										2012		2013		2014		EXCLUDE for IP	
										Actual SO <sub>2</sub> TPY	EXCLUDE for IP	Actual SO <sub>2</sub> TPY	EXCLUDE for IP	Actual SO <sub>2</sub> TPY	EXCLUDE for IP	EXCLUDE for SCE&G	EXCLUDE for SCE&G
Office of General Service DHEC lab	1900-0109	Richland	23.91	503495.0	3772060.0	37.4	43.0	747.6	859.2	YES	YES						
Palmetto Baptist Medical Center	1900-0044	Richland	112.51	496930.0	3762909.0	38.8	43.0	776.7	860.4	YES	YES						
Office of General Services	1900-0197	Richland	14.87	503550.5	3772416.5	37.5	43.2	751.0	863.2	YES	YES						
REA Construction Co	9800-0083	PORTABLE	127.02	492890.0	3753120.0	40.7	43.3	814.0	866.5	YES	YES						
Southeastern Concrete Products	1560-0063	Lexington	46.65	494475.0	3758564.0	40.0	43.5	799.4	869.0	YES	YES						
Diamond Pet Food	1560-0050	Lexington	0.18	491447.0	3744269.0	42.4	43.6	847.0	871.1	YES	YES						
City of Orangeburg Dept of Public Utilities	1860-0117	Orangeburg	1.44	512050.0	3705591.0	49.0	43.7	980.5	874.7	YES	YES						
Office of General Services Cola. Bldg.	1900-0161	Richland	74.36	495555.0	3762058.0	39.9	43.9	797.2	877.2	YES	YES						
Providence Northeast	1900-0202	Richland	9.99	503762.0	3773727.0	38.2	43.9	763.8	878.4	YES	YES						
Richland Memorial Hospital	1900-0062	Richland	213.74	497097.3	3765249.3	39.5	44.0	790.7	880.3	YES	YES						
Office of General Service DHEC	1900-0104	Richland	23.23	496666.0	3764710.0	39.7	44.1	794.5	882.4	YES	YES						
The Ritedose Corporation	1900-0137	Richland	8.37	503455.5	3773800.0	38.5	44.2	769.5	883.8	YES	YES						
Columbia Farms	1560-0121	Lexington	130.09	494809.1	3761710.3	40.5	44.4	809.3	887.7	YES	YES						
Backman Lumber	1560-0188	Lexington	1.00	492474.0	3756110.0	41.5	44.5	829.5	890.6	YES	YES						
Columbia Farms/OSI LP	1560-0115	Lexington	31.62	491623.0	3755101.0	42.2	45.1	843.5	901.1	YES	YES						
Federal Mogul Corp	1860-0094	Orangeburg	0.05	514185.2	3702462.9	51.0	45.4	1020. <sup>2</sup>	908.2	YES	YES						

Table 3 (Cont'd.) Summary of 20D Screening Analysis

Company Name	Permit #	County Name	Allowable SO <sub>2</sub> TPY	UTM-17N (NAD83) East (m)	UTM-17N (NAD83) North (m)	Distance from IP (km)	Distance from SCE&G IP (km)	20D for IP	20D for SCE&G	Based on Allowable Emissions				Based on 2014 Actual Emissions			
										2012		2013		2014		EXCLUDE for IP	
										Actual SO <sub>2</sub> TPY	EXCLUDE for SCE&G	Actual SO <sub>2</sub> TPY	EXCLUDE for SCE&G	Actual SO <sub>2</sub> TPY	EXCLUDE for SCE&G	EXCLUDE for IP	EXCLUDE for SCE&G
Invisia	1380-0003	Kershaw	3.93	531441.7	3788160.1	38.5	45.5	770.3	909.3	YES	YES						
Okorite Company	1860-0082	Orangeburg	0.06	514276.2	3701893.9	51.5	45.9	1030. <sub>1</sub>	917.5	YES	YES						
Mars Petcare US	1860-0090	Orangeburg	0.11	513914.2	3701597.0	51.9	46.3	1038. <sub>3</sub>	926.1	YES	YES						
DeRoyal Textiles	1380-0019	Kershaw	61.76	538003.4	3789042.5	39.6	46.3	792.1	926.2	YES	YES						
Oak-Mitsui, Inc.	1380-0038	Kershaw	0.19	533318.0	3789377.0	39.7	46.6	793.6	931.5	YES	YES						
SI Group (formerly Albemarle)	1860-0004	Orangeburg	167.68	511129.4	3702734.3	52.0	46.7	1040. <sub>0</sub>	933.1	YES	YES						
Trinity Industries	1860-0110	Orangeburg	0.02	513824.0	3700985.0	52.5	46.9	1050. <sub>4</sub>	937.8	YES	YES						
City of Orangeburg	1860-0085	Orangeburg	8.79	513640.2	3700074.0	53.4	47.8	1068. <sub>6</sub>	955.8	YES	YES						
Gulbrandsen Manufacturing	1860-0080	Orangeburg	32.94	514451.0	3699585.0	53.6	47.9	1072. <sub>2</sub>	957.8	YES	YES						
Kendall Company	1380-0001	Kershaw	36.66	537505.6	3790722.9	41.2	48.0	824.5	959.1	YES	YES						
Hanson Brick	1900-0010	Richland	97.17	493891.3	3768240.8	43.7	48.3	873.7	966.2	YES	YES						
Intertape Polymer Corp	1900-0274	Richland	0.04	503222.0	3780724.0	43.3	49.4	866.3	988.8	YES	YES						
Akebono Brake Corp	1560-0133	Lexington	0.82	487140.0	3757380.0	46.9	50.0	938.8	1000.0	YES	YES						
Lexington Medical Center	1560-0055	Lexington	122.07	488461.0	3762835.0	46.9	50.6	937.3	1012.7	YES	YES						
Arcilin Surfaces	1900-0093	Richland	20.89	503192.2	3782366.4	44.5	50.7	890.4	1014.4	YES	YES						
Lee County Landfill SC, Inc	1540-0029	Lee	197.06	566932.0	3782360.0	46.8	50.8	935.5	1016.5	YES	YES						
Palmetto Paving	9900-0478	PORTABLE	17.08	565595.0	3783533.0	46.7	50.9	933.4	1018.6	YES	YES						

Table 3 (Cont'd.)      Summary of 20D Screening Analysis

Company Name	Permit #	County Name	Allowable SO <sub>2</sub> TPY	UTM-17N (NAD83) East (m)	UTM-17N (NAD83) North (m)	Distance from IP (km)	Distance from SCE&G IP (km)	20D for IP SCE&G	20D for IP SCE&G	Based on Allowable Emissions				Based on 2014 Actual Emissions			
										2012 Actual SO <sub>2</sub> TPY		2013 Actual SO <sub>2</sub> TPY		2014 Actual SO <sub>2</sub> TPY		EXCLUDE for IP	
										EXCLUDE for IP	EXCLUDE for IP	EXCLUDE for IP	EXCLUDE for IP	EXCLUDE for IP	EXCLUDE for IP	EXCLUDE for IP	EXCLUDE for IP
CR Jackson	9900-0036	PORTABLE	101.62	488894.0	3765056.0	47.1	51.2	942.5	1023.2	YES	YES						
US Silica, Inc.	1560-0005	Lexington	295.21	484067.6	3748816.0	49.4	51.3	987.8	1025.2	YES	YES						
Columbia Silica Sand, Inc	1560-0037	Lexington	65.26	483900.0	3748686.0	49.6	51.4	991.2	1028.2	YES	YES						
Santee Cooper Lee County Landfill Gas to Energy Facility	1540-0031	Lee	17.04	567509.6	3782655.4	47.4	51.4	947.9	1028.4	YES	YES						
Hueck Foils, Inc.	1900-0146	Richland	0.05	501275.0	3781767.0	45.4	51.5	908.5	1029.9	YES	YES						
SC Dept of Corrections	1900-0121	Richland	28.29	489370.0	3769550.0	48.3	52.9	966.8	1057.1	YES	YES						
SRE Kershaw	1380-0077	Kershaw	30.13	543200.0	3795916.0	47.2	53.7	944.7	1074.3	YES	YES						
New South Lumber Co. Inc.	1380-0025	Kershaw	13.86	542330.0	3798504.0	49.6	56.2	992.1	1123.1	YES	YES						

Based on experience and best professional judgment, all other sources in the screening area, besides the two primary sources (SCE&G Wateree Station and IP Eastover Mill) and Specialty Minerals, Inc. were excluded from the cumulative impact analysis.

### **3.2 Receptor Grid**

A Cartesian (rectangular) receptor network was used for the cumulative impact analysis for attainment area designation purposes. The network, described below, includes a series of nested grids roughly centered on each primary facility (SCE&G Wateree Station and IP Eastover Mill).

An inner grid of approximately 10,000 receptors with a spacing of 100m extends outward from each primary facility boundary to a distance of approximately 1 km and covers an area of approximately 7 km x 16.5 km. An intermediate grid of approximately 3,000 receptors with a spacing of 250m extends from the outer edge of the 100m spaced receptor grid out to a distance of approximately 5 km from the two facilities, and the outer boundary covers an area of approximately 15 km x 21 km. An outer grid of approximately 2,000 receptors with a spacing of 500m extends from the outer edge of the 250m spaced receptor grid out to a distance of approximately 10 km from the two facilities, and the outer boundary covers an area of approximately 25 km x 31 km. Receptors within the boundaries of SCE&G Wateree Station or IP Eastover Mill were excluded.

Additionally, receptors at a spacing of no greater than 25m were placed along each of the primary facility property boundaries, with approximately 350 receptors along the Wateree Station property boundary and approximately 1,250 receptors along the Eastover Mill property boundary. The property boundaries are defined in a manner consistent with prior modeling analyses that have been submitted to DHEC BAQ.

The resulting total number of receptors is approximately 17,000. A plot of the proposed receptor grid is shown in Figure 12. The receptor resolution used in the modeling meets or exceeds that recommended in DHEC BAQ guidance and in the TAD.

A close-up view of the SCE&G Wateree Station modeled ambient air boundary is shown in Figure 13. The ambient air boundary is comprised of the physical barrier of the Wateree River and fencing that is controlled/patrolled by security that is on-site 24 hours per day, 7 days per week (24/7). This ambient air boundary is the same as the ambient air boundary used in previous air dispersion modeling demonstrations.

A close-up view of the IP Eastover Mill modeled ambient air boundary is shown in Figure 14. The ambient air boundary is comprised of physical barriers, fencing, signage, and areas that are controlled/patrolled by mill security that is on-site 24/7. The Eastover property is large and diverse. In addition to paper manufacturing, the facility includes an integrated woodyard, extensive log storage, and an onsite landfill. Non-industrial land use within the property includes the employee training center, landscaped areas, agricultural fields, forestry test plots, and actively managed forestlands. The mill site is home to an extensive wildlife population. The Eastover Mill ambient air boundary includes all of these areas. Each portion of the ambient air boundary is described in more detail below.

The eastern portion of the ambient air boundary runs along the Wateree River. The river represents a physical barrier that restricts public access to the mill property which leads directly to the river bank. Along the river bank there is a sharp embankment with dense underbrush that is difficult to navigate and that acts as a strong deterrent to public access to mill property. Signs are installed at areas potentially accessible to the public and on the railroad right of way.

The southern portion of the ambient air boundary runs along a railroad that traverses the mill property from the river all the way to state highway 601. The mill owns property on both sides of the railroad right of way. The railroad also represents a physical barrier that restricts public access. The railroad right of way includes a steep embankment up from the Wateree River on the east side of the right of way along with a locked gate and no trespassing signs at the intersection of state highway 601. North of the railroad, there are locked gates, drainage canals, berms, and dense forest and underbrush in areas that are difficult to navigate, all of which act as strong deterrents to public access to mill property.

The southwestern portion of the ambient air boundary runs along state highway 601 from the railroad to the main plant entrance road. The mill property runs right up to state highway 601. This portion of the ambient air boundary is controlled by a locked gate and drainage canals that impede public access. There is also a considerable amount of plant personnel (including security) that patrol the main plant entrance 24/7. Trespassers along this portion of the ambient air boundary would be escorted off mill property by plant security.

The northwestern and northern portion of the ambient air boundary runs from the main plant entrance on state highway 601 north and around to the Wateree River. The mill owns multiple land parcels in this area, which are primarily dedicated to forestry and wildlife management. Public access to this area is controlled by a combination of physical barriers (including drainage canals, fencing, soil embankments, i.e. dense forest and underbrush), installed controls (fencing, locked gates and No Trespassing signs), and surveillance/patrol by mill security. These barriers make it difficult (and unlawful) for the public to gain access and spend prolonged amounts of time on the mill property. The adjacent properties owned by others are primarily forest lands and several residential properties; receptors will be placed on all adjacent properties.

Receptors were also placed at the location of the two nearest ambient SO<sub>2</sub> monitors (Parklane and Congaree Bluff).

Guidance in Section 4.2 of the TAD indicates that receptors are not required in areas, such as water bodies, where placement of a monitor would not be feasible. To be conservative, receptors in such areas were not excluded.

The AERMAP preprocessor (Version 11103) was used to obtain receptor elevations and hill heights for the receptors modeled in AERMOD. AERMAP was run with 30 meter National Elevation Dataset (NED) Digital Elevation Model (DEM) GeoTIFF format files obtained from the U.S. Geological Survey (USGS).

The modeling uses a Universal Transverse Mercator (UTM) coordinate system. Coordinates are in Zone 17N and the datum is NAD83.

The receptor grid was sized such that there are no predicted SO<sub>2</sub> concentrations near or above the NAAQS at any receptors near the edge of the grid. The receptor spacing is no greater than 100m in all areas where total predicted concentrations (including background concentrations) are within 10% of the NAAQS.

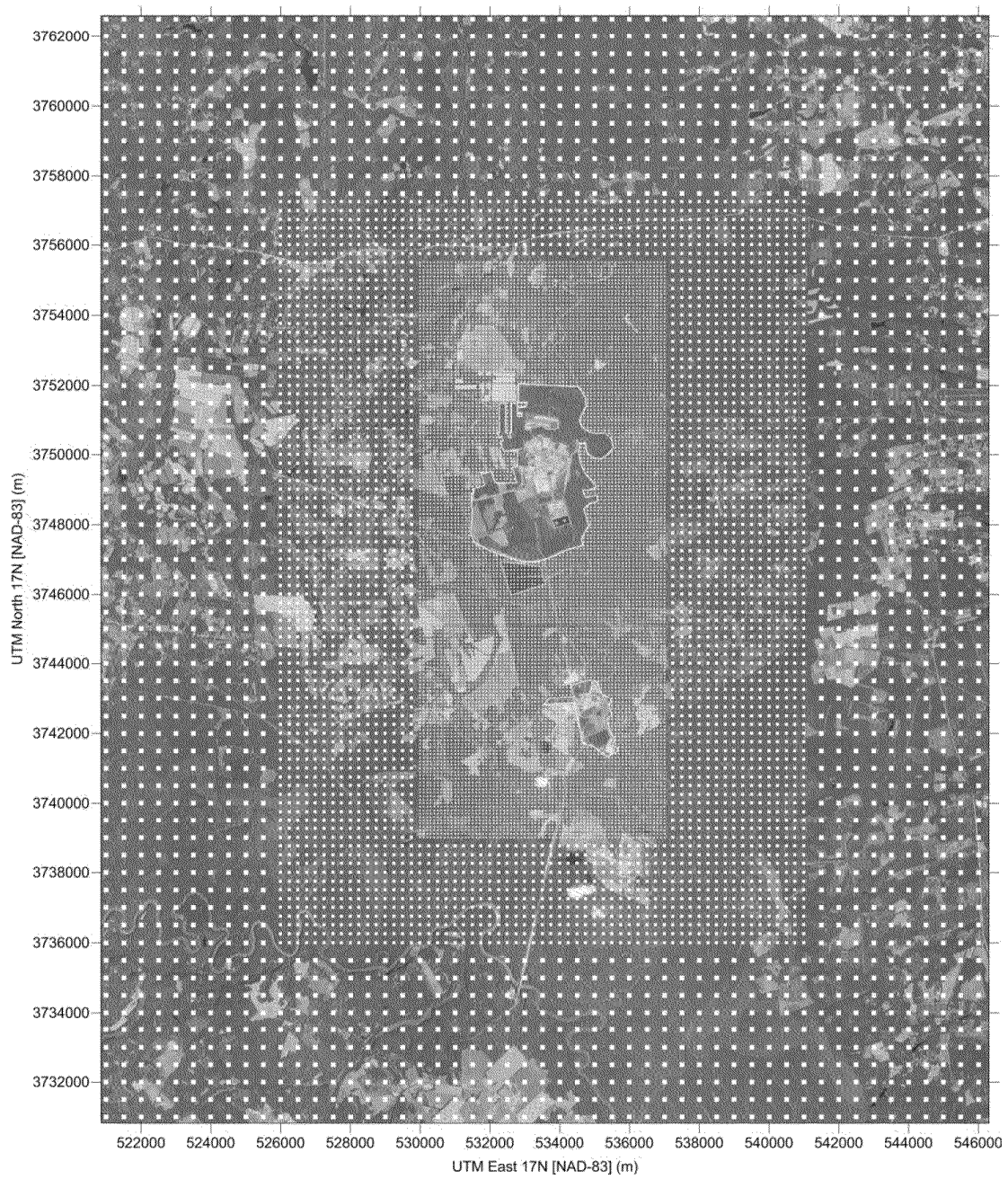


Figure 12 Plot of Cartesian and property boundary receptors



Figure 13 SCE&G Wateree Station ambient air boundary



Figure 14 IP Eastover Mill ambient air boundary

## 4 Emission Rates and Source Characterization

The emission rates used in the modeling analyses are listed below in Sections 4.1 and 4.2.

### 4.1 SCE&G Wateree Station Source Data

Table 4 SCE&G Wateree Station SO<sub>2</sub> Constant Emission Rates and Source Parameters

Stack ID	SO <sub>2</sub> Emission Rate (lb/hr)	SO <sub>2</sub> Emission Rate (g/s)	Stack Height (m)	Exit Velocity (m/s)	Stack Diameter (m)	Stack Temperature (K)
Wat1	Actual Hourly	Actual Hourly	91.44	Actual Hourly	5.89	Actual Hourly
Wat2	Actual Hourly	Actual Hourly	91.44	Actual Hourly	5.89	Actual Hourly
WatC	Actual Hourly	Actual Hourly	121.92 (Actual)	Actual Hourly	8.53	Actual Hourly
UB12	2,687.3	338.6	106.81 (GEP)	16.30	8.53	327.00
AB1	0.33	0.04	13.72	21.34	0.10	605.37

SCE&G Wateree Station was modeled using both actual hourly and constant emission rates. Following the January 13, 2017 permit revision, use of the FGD is no longer a voluntary permit condition. Presently and in future standard operations, the two main boilers exhaust through shared stack UB12 with all emissions controlled by the FGD. In past operations, however, emissions from the two main boilers could either exhaust directly from the uncontrolled dedicated main boiler stacks (Wat1 and Wat2), through the shared stack (WatC) controlled by the FGD, or some combination thereof. For the purposes of demonstrating that the area both was and will continue to be in attainment with respect to the 1-hour NAAQS for SO<sub>2</sub>, SCE&G Wateree Station was modeled using actual hourly emission rates over the period 2014-2016 as well as with constant emission rates expected to be higher than any future actual emissions. Table 4 provides the SO<sub>2</sub> emission rates and stack parameters used for modeling SCE&G Wateree Station.

The constant modeled emission rate of 2,687.3 lb/hr for UB12 is lower than the maximum controlled potential to emit (PTE) of 3,339.5 lb/hr, but is expected to be higher than any future actual emissions. SCE&G has applied for and expects to receive a revised air permit from DHEC BAQ with a maximum emission rate limit of 2,687.3 lb/hr for stack UB12. The emission rate listed for AB1 represents uncontrolled PTE based on combusting No. 2 fuel oil with 0.0015% sulfur content by weight.

The WatC/UB12 actual stack height of 121.92m for the shared stack exceeds the GEP formula stack height of 106.81m listed. Actual stack height was used for the modeling analysis using actual emission rates, and GEP formula height was used for the constant emissions modeling analysis.

SCE&G Wateree Station includes three emergency generators. These are described in Table 1, are intermittent SO<sub>2</sub> emission sources, and were not included in the modeling per the March 1, 2011 additional clarification memo.

## 4.2 IP Eastover Mill Source Data

Table 5 IP Eastover Mill SO<sub>2</sub> Constant Emission Rates and Source Parameters

Stack ID	SO <sub>2</sub> Emission Rate (lb/hr)	SO <sub>2</sub> Emission Rate (g/s)	Stack Height (m)	Exit Velocity (m/s)	Stack Diameter (m)	Stack Temperature (K)
371A	11.04	1.39	53.89	10.70	1.31	329.82
372A	15.84	2.00	53.89	21.31	1.80	518.15
381C	4.20	0.53	75.99	6.49	1.40	349.26
382B	9.36	1.18	75.99	8.41	1.80	350.93
381A/501A	606.91	76.47	86.11	17.19	4.11	459.26
382A/331A	420.88	53.03	141.09	15.51	4.30	460.93
502A	971.00	122.34	141.09	20.79	2.90	464.82
96SRC*	0.83	0.105	16.80	12.53	0.60	344.30
97SRC*	0.83	0.105	16.80	12.53	0.60	344.30
98SRC*	0.83	0.105	16.80	12.53	0.60	344.30

\* Carbonator sources from Specialty Minerals, Inc.

IP Eastover Mill was modeled using the constant SO<sub>2</sub> emission rates and stack parameters presented in Table 5.

### 4.2.1 Minor Contributors

The SO<sub>2</sub> emission rates for IP Eastover Mill presented in Table 5 represent the maximum potential emission rates for sources 371A (No. 1 Lime Kiln), 372A (No. 2 Lime Kiln), 381C (No. 1 Smelt Dissolving Tank), and 382B (No. 2 Smelt Dissolving Tank). These four stacks are relatively small emission sources.

Table 5 includes emissions from the three carbonators operated by Specialty Minerals, Inc. These sources (96SRC, 97SRC and 98SRC) operate within the IP Eastover Mill property and were included in the modeling. The stack heights modeled are shown in Table 5 and are the actual heights for each of these stacks. All of these stack heights are less than the GEP formula height.

Table 2 lists the annual emission rates and hours of operation over the last three years (2013-2015) for the insignificant stationary SO<sub>2</sub> emissions sources at the mill. The years 2013-2015 were used, as hourly runtime data were not available for 2012. As shown in Table 2, these sources have very low SO<sub>2</sub> emission rates and operate very infrequently. Therefore, they should not have any appreciable effect on 1-hour SO<sub>2</sub> ambient concentrations and were not included in the modeling. The only sources at the mill that were included in the modeling are shown in Table 5.

The IP Eastover mill includes two different systems for controlling NCG emissions to comply with regulatory requirements. The kraft pulping process generates total reduced sulfur (TRS) NCG that are odorous and require collection and treatment under the federal New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants (NESHAP) programs. These TRS compounds are treated by thermal oxidation, which converts the TRS compounds into SO<sub>2</sub>. At IP Eastover Mill, the majority of TRS gases are collected into the Concentrated NCG System. Other TRS gases are collected into the Dilute NCG System. The treatment devices for these systems are binary; an NCG System can be treated in either one or the other but not simultaneously in both.

The remaining three stacks (381A/501A, 382A/331A, and 502A) have larger SO<sub>2</sub> emission rates and multiple operating modes that must be considered in order to correctly characterize the impact of facility emissions on ambient SO<sub>2</sub> concentrations.

#### **4.2.2 Stack 381A/501A**

The stack 381A/501A is a combined stack serving No. 1 Recovery Furnace (381A) and No. 1 Power Boiler (501A). The No. 1 Power Boiler is the primary control device for the mill's

Dilute NCG System and does not have add-on SO<sub>2</sub> controls. The emission rate presented in Table 5 for Stack 381A/501A is less than the maximum short-term emission rate for this stack allowed by the mill’s Title V Permit, but is expected to be higher than any future actual emissions. There are two contributions to the SO<sub>2</sub> emission rate for source 501A (the No. 1 Power Boiler): combustion of dilute NCGs (which generates SO<sub>2</sub> from the oxidation of TRS compounds) and combustion of fuel.

In 2016, IP completed a significant project that reduced SO<sub>2</sub> emissions from No. 1 Power Boiler. DHEC construction permit No. 1900-0046-DN was issued to convert No. 1 Power Boiler from coal and residual oil to 100% natural gas only. With the startup of this project in December 2016, coal is no longer used as a fuel at the IP Eastover Mill and natural gas is the sole fuel for No.1 Power Boiler. Consequently, the emissions rate from fuel combustion assumes that the boiler is operating at its maximum heat input rate when firing natural gas.

Including SO<sub>2</sub> emissions from the combustion of Dilute NCGs in the No. 1 Power Boiler is the worst case from an ambient impacts perspective because this stack is much shorter (280 feet) than the stack for the backup dilute NCG treatment device, the No. 2 Power Boiler (460 feet). Neither source has an SO<sub>2</sub> scrubber. Model runs confirmed this assumption and are available on request.

Table 6            IP Eastover Mill Dilute NCG Treatment Location

Dilute NCG Treatment Location	Stack Height (ft)
No. 1 Power Boiler	280
No. 2 Power Boiler	460

**4.2.3 Stack 382A/331A**

The stack 382A/331A is a combined stack serving No. 2 Recovery Furnace (382A) and the NCG Incinerator (331A). The NCG Incinerator is the primary treatment device for the mill’s Concentrated NCG System and is equipped with a packed-column SO<sub>2</sub> scrubber. For source

382A (the No. 2 Recovery Furnace), the modeled emission rate of 420.88 lb/hr is lower than the maximum short-term emission rate of 666 lb/hr allowed by the facility’s Title V Permit but is expected to be higher than any future actual emissions. Zero SO<sub>2</sub> emission contribution is included in Table 5 from source 331A (the No. 2 NCG Incinerator) because it is more conservative in terms of offsite emission impacts to assume that the incinerator is not operating and the concentrated NCGs normally processed in this unit is being combusted in the backup incineration point (Source 502A, the No. 2 Power Boiler), because the backup incineration point is not equipped with add-on SO<sub>2</sub> controls. Model runs confirmed this assumption and are included in the electronic documentation.

To demonstrate it is more conservative to assume the concentrated NCGs are burned in the No. 2 Power Boiler (502A) as opposed to the NCG Incinerator (331A), modeling was performed for these two stacks using a unit emission rate of 1 g/s. This analysis method allowed a comparison of the normalized concentrations for each source in the form of the 1-hour SO<sub>2</sub> NAAQS (i.e. the 3-year averaged, 4th high, maximum daily, 1-hour concentration). The modeling was performed using the methodologies presented in this report and stack parameters listed in Table 5. The resulting normalized design concentrations are 0.57 µg/m<sup>3</sup> per g/s for 502A and 0.44 µg/m<sup>3</sup> per g/s for 382A/331A stacks. This indicates that the 502A stack has a 30% higher unit rate modeled concentration compared to the 382A/331A stack for an identical unit emission rate (1 g/s). These results affirm that assuming the concentrated NCGs are burned in the No. 2 Power Boiler (502A) as opposed to the NCG Incinerator (382A/331A) is the worst-case scenario for the purposes of the DRR modeling.

Table 7            IP Eastover Mill Concentrated NCG Treatment Location

Concentrated NCG Treatment Location	SO <sub>2</sub> Control Device	Stack Height (ft)
NCG Incinerator	Packed Column Caustic Scrubber	460
No. 2 Power Boiler	No add-on control	460

#### **4.2.4 Stack 502A**

The stack 502A serves No. 2 Power Boiler. The No. 2 Power Boiler is the backup treatment device for the mill's Concentrated NCG System and the Dilute NCG System and as noted above does not have add-on SO<sub>2</sub> controls. There are three contributions to the SO<sub>2</sub> emission rate for source 502A: fuel burning, concentrated NCG combustion, and rectified methanol combustion. For fuel burning, the emissions rate assumes that the unit is operating at its maximum heat input rate (500 MMBtu/hr) burning the worst-case fuel from an SO<sub>2</sub> emissions rate generation perspective (tire-derived fuel) at the short term emission rate allowed by the Title V Permit. The contribution from concentrated NCG combustion utilizes the maximum short-term emissions rate for this unit included in the facility's Title V permit, and the contribution for methanol combustion assumes that the unit is burning methanol at a maximum rate of 4 GPM.

#### **4.2.5 Comparison of Modeled and Actual Emission Rates**

Table 8 compares the modeled and 2014-2016 actual SO<sub>2</sub> emission rates from the No. 1 Recovery Furnace (381A) and No. 2 Recovery Furnace (382A). The data presented demonstrate that the modeled emission rates from these two sources were considerably and consistently higher than the actual emission rates during 2014-2016 and therefore conservative.

As shown in Table 5, the modeled emission rate from 381A/501A is 606.91 lb/hr and consists of emissions from the operation of the No. 1 Recovery Furnace (381A) and combustion of natural gas and dilute NCGs in the No. 1 Power Boiler (501A), as described in Section 4.2.2. The SO<sub>2</sub> emission rate associated with dilute NCG combustion in the IP Eastover Mill's Title V permit is 894 TPY (204.11 lb/hr), while the SO<sub>2</sub> emissions due to natural gas combustion are essentially negligible. Accordingly, the fraction of the 381A/501A modeled emission rate attributed to the No. 1 Recovery Furnace (381A) is 402.8 lb/hr. The maximum actual hourly emission rate (computed from recorded monthly values) over 2014-2016 was 21.89 lb/hr for 381A, which is significantly lower than the modeled emission rate of 402.8 lb/hr.

As described in Section 4.2.3, the modeled emission rate of 420.88 lb/hr from 382A/331A is due entirely to the operation of the No. 2 Recovery Furnace (382A) based on the conservative assumption that concentrated NCGs are combusted in the No. 2 Power Boiler (502A) and not

the NCG Incinerator (331A). The maximum actual hourly emission rate (computed from recorded monthly values) over 2014-2016 was 23.29 lb/hr for 382A, which is significantly lower than the modeled emission rate of 420.88 lb/hr.

Table 8 IP Eastover Mill 2014-2016 Actual Emission SO<sub>2</sub> Rates for 381A and 382A

Month-Year	Monthly Actual Emissions (tons/month)		Monthly Actual Operating Hours		Computed Hourly Emission Rate (lb/hr)	
	381A	382A	381A	382A	381A	382A
January 2014	3.05	8.55	744	734	8.20	23.29
February 2014	0.13	3.95	672	672	0.38	11.76
March 2014	1.28	4.30	743	743	3.45	11.55
April 2014	1.11	3.83	720	720	3.08	10.65
May 2014	0.13	5.39	744	735	0.36	14.49
June 2014	0.34	3.98	719	720	0.94	11.05
July 2014	0.14	4.23	744	744	0.37	11.36
August 2014	0.48	4.07	728	744	1.29	10.93
September 2014	0.13	4.12	720	720	0.36	11.44
October 2014	0.17	4.78	744	561	0.45	12.84
November 2014	0.13	4.44	720	720	0.36	12.33
December 2014	2.15	4.74	744	744	5.79	12.74
January 2015	0.90	4.93	744	744	2.42	13.25
February 2015	0.12	5.77	672	663	0.37	17.18
March 2015	0.14	4.98	743	743	0.37	13.37
April 2015	1.13	4.44	720	719	3.14	12.32
May 2015	0.14	4.88	744	744	0.37	13.11
June 2015	0.13	5.88	720	712	0.37	16.33
July 2015	1.58	4.46	744	744	4.26	11.98
August 2015	1.50	4.56	731	744	4.03	12.27
September 2015	0.13	4.59	720	720	0.36	12.74
October 2015	1.49	7.35	744	603	4.00	19.76
November 2015	0.13	5.93	720	720	0.37	16.47
December 2015	1.09	5.05	744	744	2.92	13.57
January 2016	0.85	5.96	743	744	2.28	16.03
February 2016	0.13	7.00	696	696	0.37	20.11
March 2016	0.14	4.93	743	743	0.37	13.26
April 2016	1.36	4.28	715	720	3.77	11.90
May 2016	0.13	4.82	744	744	0.36	12.95
June 2016	0.70	5.76	720	713	1.93	16.01
July 2016	0.13	4.83	744	744	0.36	12.98
August 2016	1.88	4.81	744	744	5.06	12.92
September 2016	0.57	4.57	720	720	1.60	12.71
October 2016	0.28	7.34	742	711	0.76	19.72
November 2016	3.30	7.52	720	720	9.15	20.88
December 2016	8.14	7.99	744	744	21.89	21.47

### **4.3 Urban vs. Rural Determination**

The DHEC BAQ land use GIS tool was utilized to determine if a 3 km area surrounding each facility should be classified as rural or urban for the purposes of this modeling analysis. The DHEC BAQ land use GIS tool makes use of 2001 National Land Cover Database (NLCD) data and was applied separately for IP Eastover Mill and SCE&G Wateree Station.

Table 9 shows the percent land use for different land use categories within 3 km of each facility. The area surrounding both facilities is predominately rural and the non-developed land use classes total about 71% for both IP Eastover Mill and SCE&G Wateree Station. Therefore, the rural option was selected in AERMOD.

Table 9 Land use percentage within 3 km of IP Eastover Mill and SCE&G Wateree Station

Land use Class	IP Eastover Mill	SCE&G Wateree Station
Open water	17.55%	17.36%
Developed, Open Space	4.80%	4.50%
Developed, Low Intensity	8.88%	9.17%
Developed, Medium Intensity	10.38%	10.25%
Developed, High Intensity	4.99%	4.94%
Barren Land	1.93%	0.02%
Deciduous Forest	5.60%	1.07%
Evergreen Forest	5.85%	10.40%
Mixed Forest	0.07%	0.08%
Scrub/Shrub	0.16%	0.13%
Grassland/Herbaceous	11.86%	6.18%
Pasture/Hay	1.90%	1.79%
Cultivated Crops	4.12%	3.08%
Woody Wetlands	16.15%	24.74%
Emergent Herbaceous	5.76%	6.30%

## 5 Meteorological Data

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### 5.1 Overview

The modeling was performed utilizing the three most recent years of meteorological data, 2014 through 2016. DHEC BAQ provided the AERMOD-ready meteorological input files for this analysis based on the most representative station. AERMOD was run using the AERMET dataset run with current default options.

IP Eastover Mill and SCE&G Wateree Station are both located approximately 40 km east-southeast of Columbia, South Carolina in Richland County, right on the Richland and Sumter County line. DHEC BAQ guidance recommends the following meteorological data sets for sources in these counties:

- Richland County – surface meteorological data from Columbia Metropolitan Airport along with concurrent upper air observations from Greensboro, North Carolina’s Piedmont Triad International Airport.
- Sumter County – surface meteorological data from Florence Regional Airport along with concurrent upper air observations from Greensboro, North Carolina’s Piedmont Triad International Airport.

In order to determine which meteorological data set is most suitable for modeling, the following factors relative to IP Eastover Mill and SCE&G Wateree Station were examined:

- proximity,
- representativeness of winds,
- representativeness of terrain, and
- representativeness of land use.

## 5.2 Proximity

Figure 15 shows the location of IP Eastover Mill and SCE&G Wateree Station relative to the Columbia Metropolitan Airport and the Florence Regional Airport. Circles of radius 20km and 50km are included to help establish scale. The Columbia Metropolitan Airport is located approximately 45 km to the west-northwest of the facilities. The Florence Regional Airport is located approximately 90 km to the east-northeast of the facilities. Columbia Metropolitan Airport is clearly much closer to the facilities and is preferred on that basis.

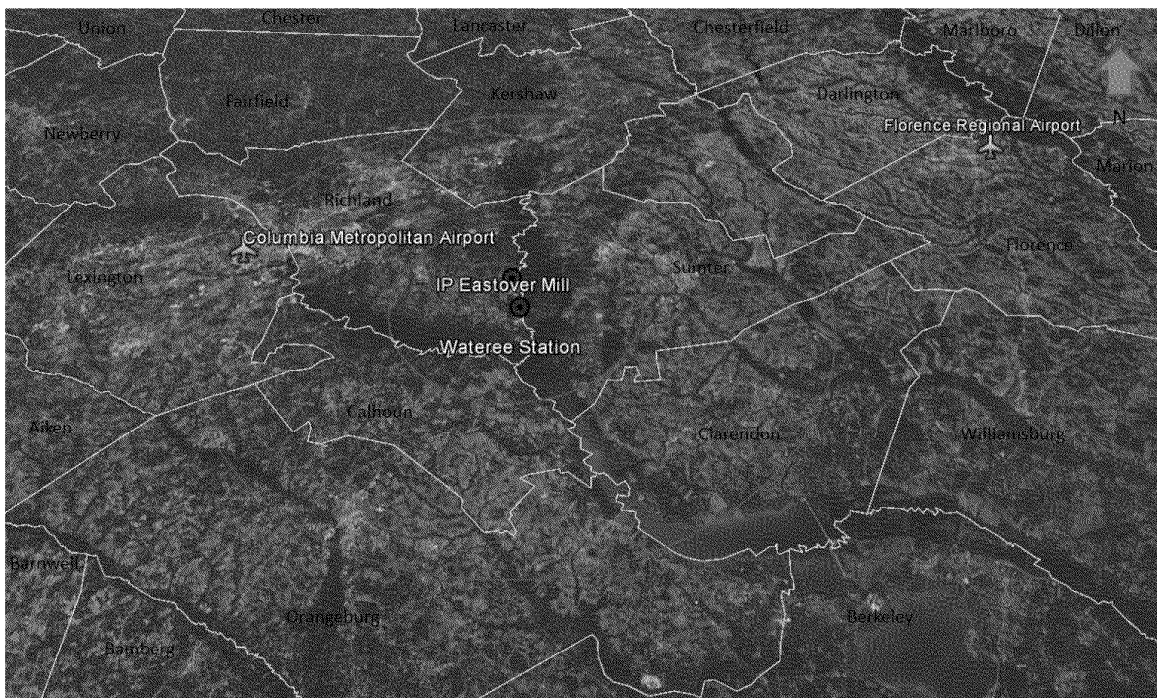


Figure 15      Location of IP Eastover Mill and SCE&G Wateree Station relative to nearby airports

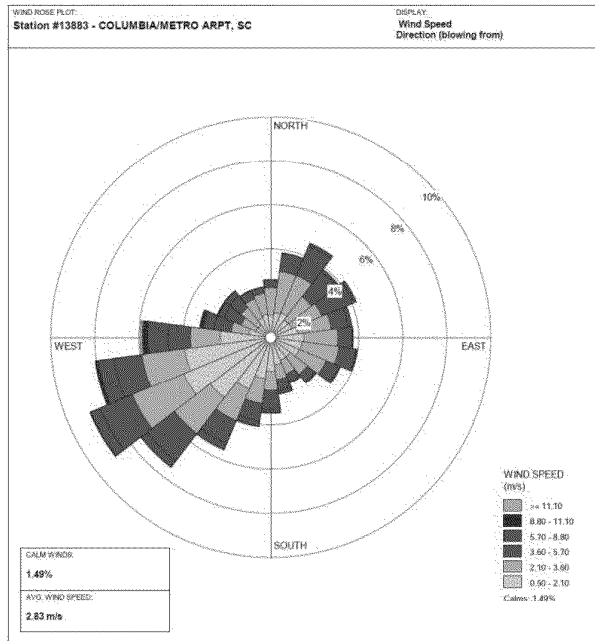
### 5.3 Representativeness of Winds

While the analysis of the representativeness of winds presented here was performed for 2012-2014, it is assumed that the same general conclusions from 2012-2014 also apply to the modeled period 2014-2016.

Figure 16 shows 3-year (2012-2014) wind roses for the Columbia Metropolitan and Florence Regional Airports. These wind roses incorporate use of the available 1-minute Automated Surface Observing System (ASOS) data for each airport. The wind rose patterns at these two sites are somewhat similar. Columbia Metropolitan has more of a westerly component to the southerly winds, whereas Florence Regional's southerly winds are more aligned with southwesterly winds. The wind speeds are also similar, with Columbia Metropolitan registering a 2.83 m/s annual average wind speed over the three years (2012-2014), and Florence Regional averaging 3.16 m/s over the same time period. Since the facilities are much closer to the Columbia Metropolitan Airport, and there are no significant terrain features nearby, the winds at Columbia Metropolitan Airport are more representative for the two facilities.

During the three year period of 2012-2014 proposed for modeling, both airports have data capture percentages of about 96% on an annual basis. Both airports also report a very low frequency of calm winds with Columbia Metropolitan at 1.39% and Florence Regional at 1.59% over the three year period. The low frequency of calm winds is largely attributable to the use of the 1-minute ASOS data.

## Columbia Metropolitan 2012-2014



## Florence Regional 2012-2014

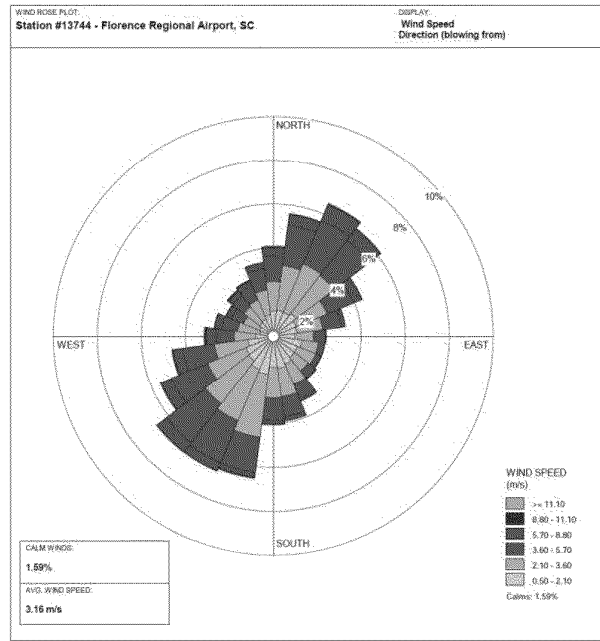


Figure 16 Wind roses for nearby airports

## 5.4 Representativeness of Terrain

IP Eastover Mill and SCE&G Wateree Station are both located in a broad river valley with largely flat terrain between and surrounding the two facilities. The terrain in the area surrounding Columbia Metropolitan Airport is similarly flat. The elevations at Columbia Metropolitan Airport, IP Eastover Mill, and SCE&G Wateree Station are comparable, and there are no significant elevation changes in the terrain between them. Therefore, Columbia Metropolitan Airport is representative of the terrain surrounding IP Eastover Mill and SCE&G Wateree Station.

## 5.5 Representativeness of Land Use

AERMET requires specification of site characteristics including surface roughness, albedo, and Bowen ratio. These parameters and their representativeness between the application site and measurement site are an important consideration when selecting a meteorological data set to use for modeling as these parameters are used as inputs to AERMET, and eventually AERMOD, to help characterize the dispersion in the atmospheric boundary layer.

AERSURFACE was used to help compare these land use parameters for the areas surrounding IP Eastover Mill, SCE&G Wateree Station, Columbia Metropolitan, and Florence Regional Airports. AERSURFACE is a tool developed by EPA (EPA, 2008) that can be used to determine the site land use characteristics based on digitized land cover data in accordance with the recommendations in the AERMOD Implementation Guide (AIG) (EPA, 2009). AERSURFACE incorporates look-up tables of representative surface characteristic values by land cover category and seasonal category.

The revised AIG provides the following recommendations for determining the site characteristics:

1. The determination of the surface roughness length should be based on an inverse distance weighted geometric mean for a default upwind distance of 1 km relative to the measurement site. Surface roughness length may be varied by sector to account for

variations in land cover near the measurement site; however, the sector widths should be no smaller than 30 degrees.

2. The determination of the Bowen ratio should be based on a simple unweighted geometric mean (i.e., no direction or distance dependency) for a representative domain, with a default domain defined by a 10 km by 10 km region centered on the measurement site.
3. The determination of the albedo should be based on a simple unweighted arithmetic mean (i.e., no direction or distance dependency) for the same representative domain as defined for Bowen ratio, with a default domain defined by a 10 km by 10 km region centered on the measurement site.

The current version of AERSURFACE (Version 13016) supports the use of land cover data from the USGS National Land Cover Data 1992 archives (NLCD92). The NLCD92 archive provides data at a spatial resolution of 30m based upon a 21-category classification scheme applied over the continental U.S. Figure 17 depicts the NLCD92 data within 1 km of: Columbia Metropolitan Airport, Florence Regional Airport, IP Eastover Mill, and SCE&G Wateree Station. Figure 17 shows that there are some differences in the land use at the four sites. As such, AERSURFACE was run to quantify what these differences mean in terms of actual inputs to AERMET and AERMOD.

AERSURFACE was applied for a single 1 km sector around each site as depicted in Figure 17 using average moisture conditions and default seasonal classifications. The results of the three AERSURFACE runs are presented in Table 10. Table 10 shows the annual average albedo and Bowen ratio values are generally similar except that the Bowen ratio is a bit lower for IP Eastover Mill and SCE&G Wateree Station in comparison to the two airports. The surface roughness, however, is different. This is a common result because there are typically fewer roughness elements surrounding the anemometer at an airport than at an industrial site. In addition, the surface roughness may be a bit underestimated for the two industrial sites as the 1992 NLCD data does not accurately portray the land use around the facilities themselves. We believe that the surface roughness around the airports may also be understated because the

grassy areas surrounding each airport (within 1 km) are characterized as “Urban/Recreational Grasses” consistent with mowed and manicured lawns. It is more likely that the grassy areas surrounding the airport are closer to natural grasslands such as those used for grazing. This would support a higher surface roughness of 0.01 to 0.1 meters consistent with the AERSURFACE category for “Grasslands/Herbaceous” as opposed to 0.01 to 0.02 meters for “Urban/Recreational Grasses”.

Based on the factors discussed above, notably the much closer proximity and slightly higher surface roughness, the modeling utilized data from Columbia Metropolitan Airport along with concurrent upper air observations from Greensboro, NC for the three year period, 2012-2014.

Table 10 Land use comparison for IP Eastover Mill, SCE&G Wateree Station, and two nearby airports

Site	Annual Average Land Use		
	Albedo	Bowen	$z_o$
Columbia Metropolitan	0.16	0.69	0.049
Florence Regional	0.16	0.58	0.042
Eastover	0.15	0.36	0.308
Wateree	0.15	0.31	0.148

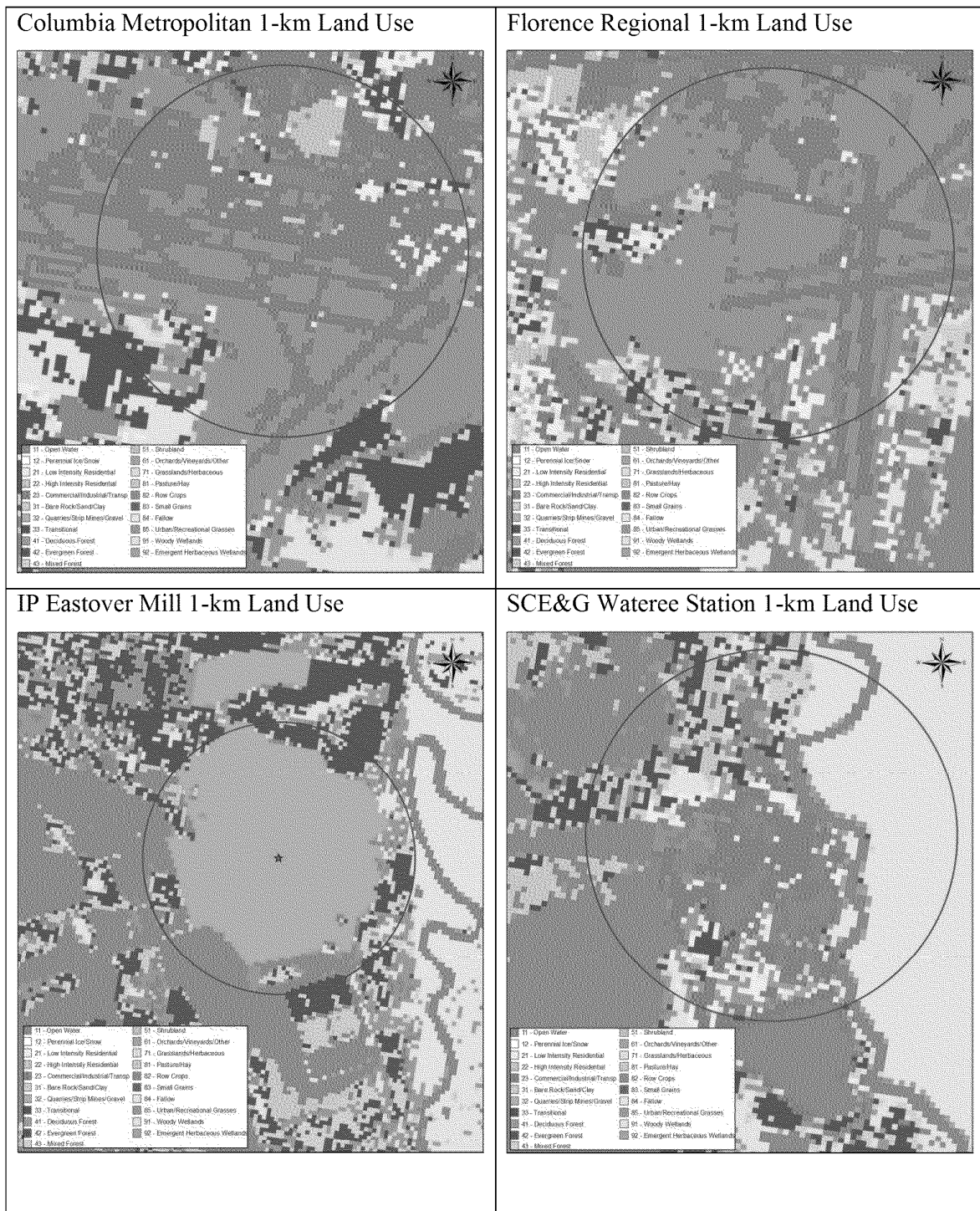


Figure 17 Land use surrounding IP Eastover Mill, SCE&G Wateree Station, and the two nearby airports

## 6 Background Monitoring Data

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### 6.1 Overview

Ambient air quality data are used to represent the contribution of non-modeled sources to the total ambient air pollutant concentrations. In order to determine compliance with the 1-hour SO<sub>2</sub> NAAQS, the modeled design concentration must be added to a measured ambient background concentration to estimate the total design concentration. This total design concentration is then compared to the NAAQS to determine compliance.

While the ambient air quality data analysis presented here was performed for 2012-2014, it is assumed that the same general conclusions also apply to the modeled period 2014-2016.

For this analysis, we considered data from two nearby monitors: Congaree Bluff (Site ID: 450790021; Address: 1850 South Cedar Creek Road) and Parklane (Site ID: 450790007; Address: 8311 Parklane Road). Figure 18 shows the location of IP Eastover Mill, SCE&G Wateree Station, and the Congaree Bluff and Parklane monitors.

Design concentrations for the period of 2012 through 2014 are provided for each of the monitors in Table 11. The design concentrations are based on the 99<sup>th</sup> percentile of the peak daily 1-hour SO<sub>2</sub> concentrations averaged over three years.

In order to determine which monitor is most appropriate to use for the ambient background concentration in this analysis, we considered several factors including proximity, data quality, and influence from nearby sources.

Table 11 1-hour SO<sub>2</sub> Design Concentrations for the Congaree Bluff and Parklane Monitors

Monitor	Year	Annual Data Capture		99 <sup>th</sup> Percentile Concentration	Design Concentration (3-year average)	
		hours	%		ppb	µg/m <sup>3</sup>
Congaree Bluff	2012	8548	98%	11 ppb		
	2013	8650	99%	22 ppb	19	51
	2014	1280	15%	25 ppb		
Parklane	2012	8315	95%	10 ppb		
	2013	8667	99%	10 ppb	12	31
	2014	8676	99%	15 ppb		

## 6.2 Proximity

As shown in Figure 18, the Congaree Bluff monitor is located approximately 15 km west-southwest of IP Eastover Mill and SCE&G Wateree Station. The Parklane monitor is located approximately 40 km west-northwest of these two facilities. The Congaree Bluff monitor is clearly affected by emissions from IP Eastover Mill and SCE&G Wateree Station when prevailing winds are in the direction from these facilities towards the monitor due to its close proximity to these two facilities. Additional discussion of nearby source influence on the Congaree Bluff monitor is provided below.

## 6.3 Data Quality

In addition to the design value concentrations, Table 11 summarizes the number of annual 1-hour observations for each of the three years. All three years for the period 2012-2014 for the Parklane monitor show excellent data capture exceeding 95%. The Congaree Bluff monitor shows excellent data capture for 2012 and 2013, exceeding 98%, but data capture for 2014 is poor at about 15%. The Congaree Bluff monitor is missing data from around March 2014 through early December 2014.



Figure 18 Location of nearby monitors in relation to IP Eastover Mill and SCE&G Wateree Station

## 6.4 Nearby Source Influence

As stated, the Congaree Bluff monitor is strongly influenced by  $\text{SO}_2$  emissions from both IP Eastover Mill and SCE&G Wateree Station. The two facilities are very close to the Congaree Bluff monitor and the observations clearly show higher concentrations when the winds blow from a direction (from the east-northeast) that would have favorable transport from IP Eastover Mill and SCE&G Wateree Station to the Congaree Bluff monitor. This is clearly evident in Figure 19, which shows a pollution rose of the Congaree Bluff monitor for the 2012-2014 period of time. The pollution wind rose incorporated wind data from Columbia Metropolitan Airport.

A pollution rose for the Parklane monitor (also shown in Figure 19) was produced for the 2012-2014 period using wind data from Columbia Metropolitan Airport. The observed concentrations

at the Parklane monitor show very little influence from IP Eastover Mill and SCE&G Wateree Station under favorable transport winds (from the southeast). The Parklane monitor does show a spike in monitored concentrations when winds are blowing from the southwest, likely due to influence from SCE&G McMeekin Station, which is located about 24 km to the west-southwest of the monitor and is currently coal-fired.

Overall, we believe the Parklane monitor is the best choice to use for the ambient background concentrations for the 1-hour SO<sub>2</sub> NAAQS analysis. Use of the Congaree Bluff monitor would result in double-counting impacts from IP Eastover Mill and SCE&G Wateree Station, since both sources are included in the modeled component of the total estimated design concentration (modeled + monitored background). In addition, data capture from the Congaree Bluff monitor is inadequate for 2014, while the Parklane monitor has strong data capture for all three years. Use of the Parklane monitor for 2012-2014 provides a conservative measure of ambient background SO<sub>2</sub> for this model application as these data are still influenced by SO<sub>2</sub> emissions from the SCE&G McMeekin Station. These emissions were reduced dramatically in March 2016 when the SCE&G McMeekin Station ceased to operate on coal and fully converted to natural gas.

Consistent with EPA guidance in their March 1, 2011 clarification memo, seasonal and hour-of-day varying background concentrations for 2014-2016 from the Parklane monitor were used in the modeling. These data were provided by DHEC BAQ and are listed in Table 12.

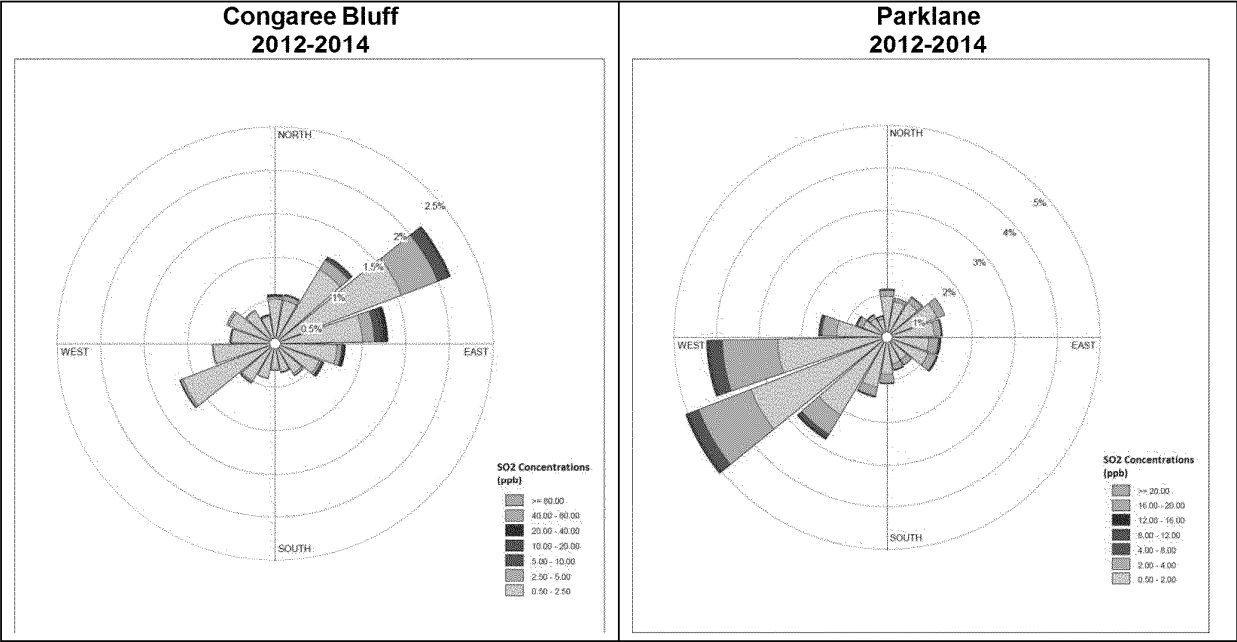


Figure 19 Pollution roses for the Congaree Bluff and Parklane monitors (2012-2014)

Table 12 Time-varying 1-hour SO<sub>2</sub> Concentrations by Season and Hour-of-day for the Parklane Monitor for 2014-2016

Hour of Day	Season 1	Season 2	Season 3	Season 4
Start Time	Dec-Jan-Feb (µg/m <sup>3</sup> )	Mar-Apr-May (µg/m <sup>3</sup> )	Jun-Jul-Aug (µg/m <sup>3</sup> )	Sep-Oct-Nov (µg/m <sup>3</sup> )
1	12.4	6.9	2.7	2.1
2	6.2	5.0	4.0	2.4
3	6.0	3.6	3.9	2.4
4	7.9	3.3	2.9	2.4
5	7.7	3.2	3.7	2.1
6	5.1	3.1	2.2	2.4
7	5.5	4.2	2.4	2.7
8	7.5	5.7	5.9	4.0
9	8.2	5.9	10.4	5.1
10	13.3	4.4	8.6	4.5
11	14.4	7.0	6.8	4.6
12	9.6	4.3	5.8	5.1
13	8.6	3.3	4.4	3.2
14	7.4	3.0	4.3	2.4
15	8.7	4.1	3.7	2.1
16	11.2	5.8	4.8	3.0
17	10.4	6.5	5.4	3.0
18	8.6	8.4	8.6	3.2
19	9.0	8.4	6.2	3.5
20	9.9	9.8	8.1	2.4
21	9.3	7.1	2.3	2.4
22	8.0	5.1	3.1	2.3
23	13.4	3.1	3.0	2.4
24	15.9	5.0	2.2	2.2

# 7 Modeling Results with Actual Emissions for SCE&G Wateree Station and Constant Emissions for IP Eastover Mill

For the modeling scenario with 2014-2016 actual hourly emissions for SCE&G Wateree Station and constant emissions for IP Eastover Mill, the 3-year averaged, 4<sup>th</sup> high, maximum daily, 1-hour SO<sub>2</sub> predicted total concentrations are in compliance at all modeled receptors with the NAAQS value of 75 parts per billion (ppb) (approximately 196.0 µg/m<sup>3</sup>).

The controlling predicted 3-year averaged, 4<sup>th</sup> high, maximum daily, 1-hour SO<sub>2</sub> impact is shown below in Table 13. The maximum total design concentration value of 170.3 µg/m<sup>3</sup> occurs just south of the IP Eastover Mill plant boundary in an area with 100-meter spaced receptors. Figure 20 shows the overall pattern and locations of the design concentrations (modeled plus ambient background).

Table 13           Controlling 3-year Averaged 4<sup>th</sup>-High Maximum Daily 1-hour SO<sub>2</sub> Predicted Concentration for SCE&G Actual Hourly and IP Constant Emissions

Pollutant and Averaging Period	IP Eastover Mill Contribution (µg/m <sup>3</sup> )	SCE&G Wateree Station Contribution (µg/m <sup>3</sup> )	Modeled Background Contribution (µg/m <sup>3</sup> )	Monitored Background Contribution (µg/m <sup>3</sup> )	Total Concentration (µg/m <sup>3</sup> )	NAAQS (µg/m <sup>3</sup> )
SO <sub>2</sub> 1-hour	67.68	97.47	0.27	4.88	170.30	196.0

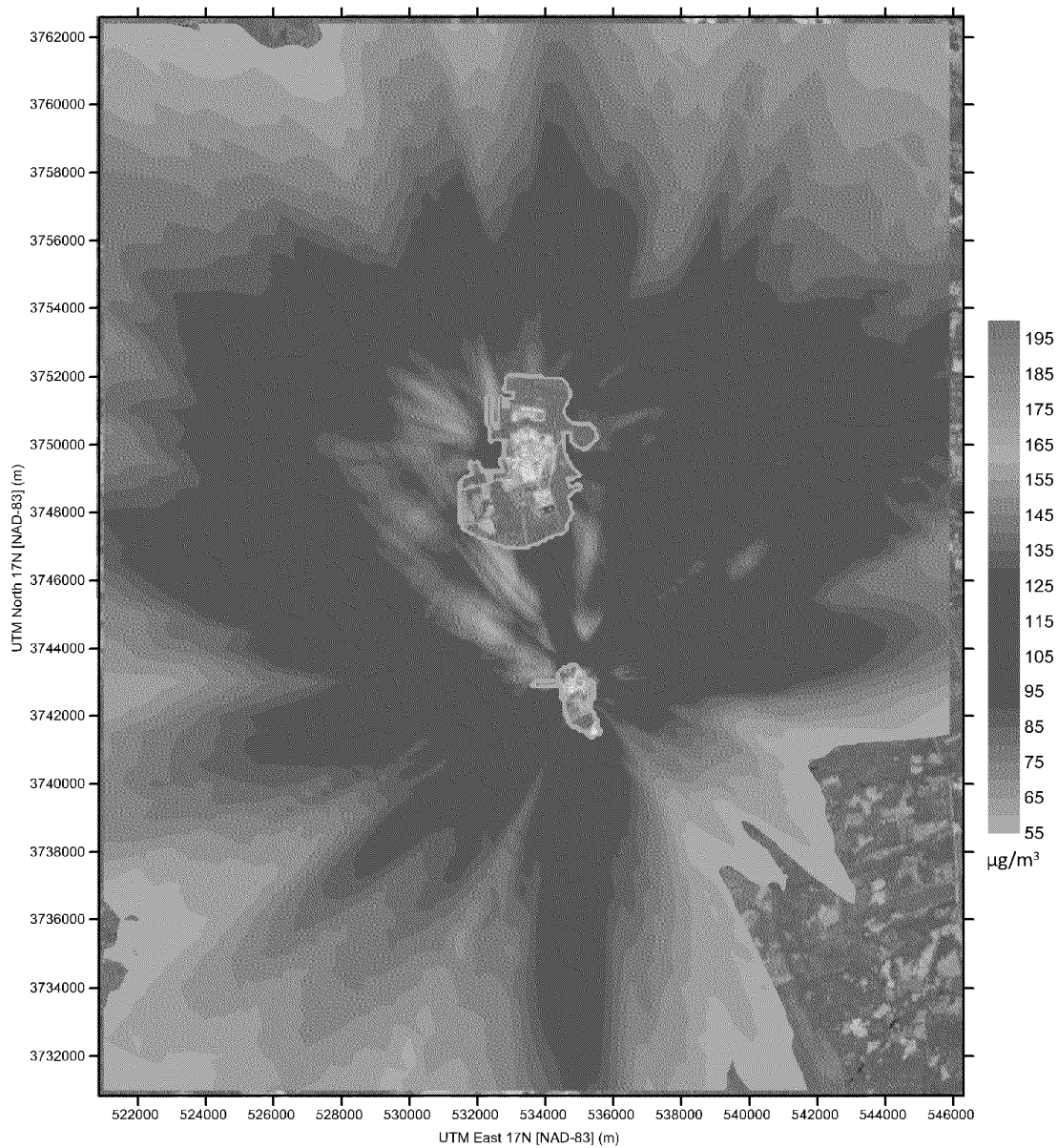


Figure 20 Isopleth map of 3-year averaged, 4<sup>th</sup> high, maximum daily, 1-hour SO<sub>2</sub> predicted total concentrations with actual hourly SCE&G Wateree Station and constant IP Eastover Mill emission rates

## 8 Modeling Results with Constant Emissions for Both SCE&G Wateree Station and IP Eastover Mill

For the modeling scenario with constant emissions for both SCE&G Wateree Station and IP Eastover Mill, the 3-year averaged, 4<sup>th</sup> high, maximum daily, 1-hour SO<sub>2</sub> predicted total concentrations are in compliance at all modeled receptors with the NAAQS value of 75 parts per billion (ppb) (approximately 196.0 µg/m<sup>3</sup>). Future actual emissions are not expected to exceed the modeled emission rates in this scenario for either facility.

The controlling predicted 3-year averaged, 4<sup>th</sup> high, maximum daily, 1-hour SO<sub>2</sub> impact is shown below in Table 14. The maximum total design concentration value of 194.86 µg/m<sup>3</sup> occurs along the northwestern boundary of the IP Eastover Mill plant boundary in an area with 100-meter spaced receptors. Figure 21 shows the overall pattern and locations of the design concentrations (modeled plus ambient background).

Table 14      Controlling 3-year Averaged 4<sup>th</sup>-High Maximum Daily 1-hour SO<sub>2</sub> Predicted Concentration for SCE&G Actual Hourly and IP Constant Emissions

Pollutant and Averaging Period	IP Eastover Mill Contribution (µg/m <sup>3</sup> )	SCE&G Wateree Station Contribution (µg/m <sup>3</sup> )	Modeled Background Contribution (µg/m <sup>3</sup> )	Monitored Background Contribution (µg/m <sup>3</sup> )	Total Concentration (µg/m <sup>3</sup> )	NAAQS (µg/m <sup>3</sup> )
SO <sub>2</sub> 1-hour	140.03	48.39	0.51	5.93	194.86	196.0

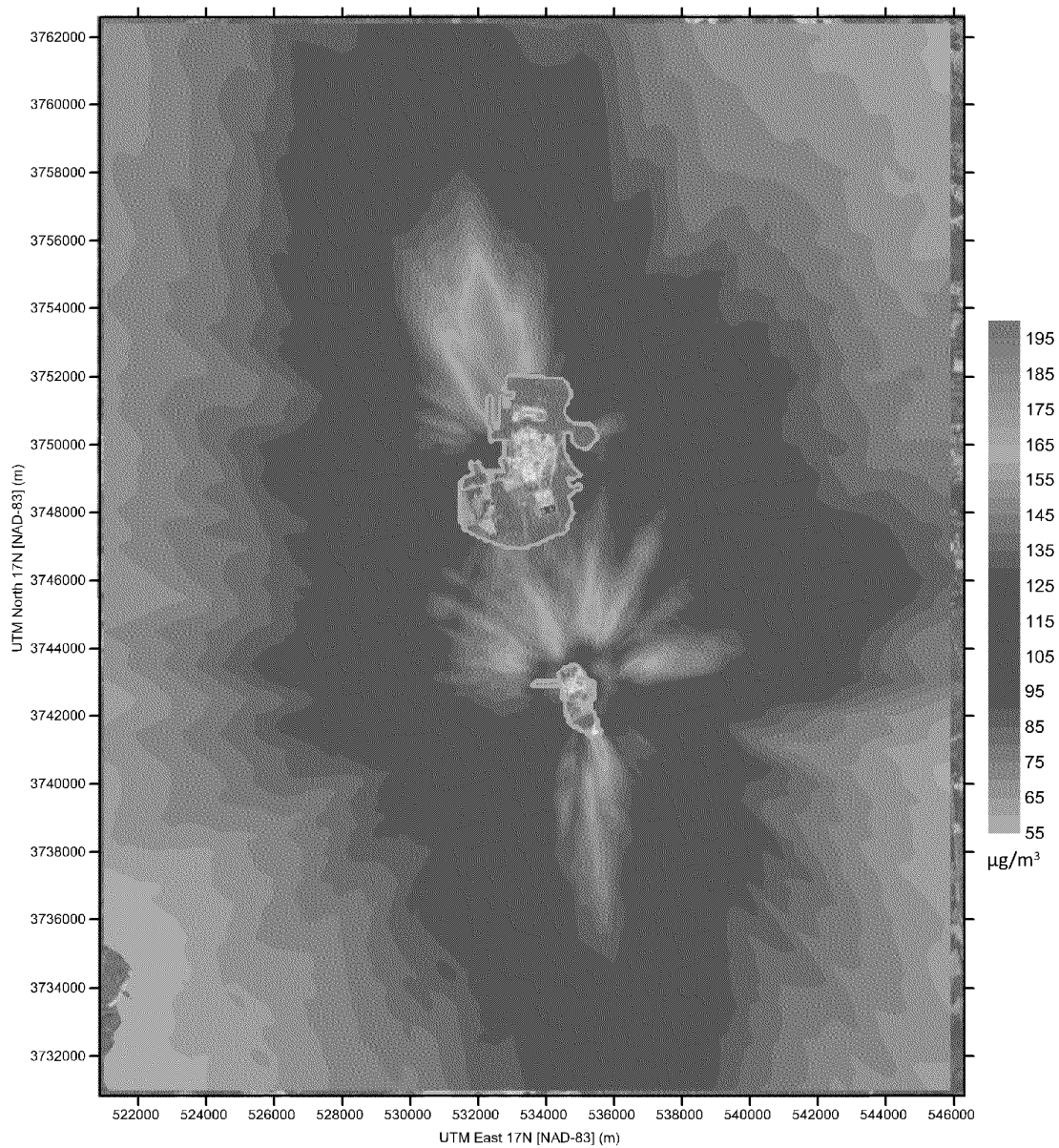


Figure 21 Isopleth map of 3-year averaged, 4<sup>th</sup> high, maximum daily, 1-hour SO<sub>2</sub> predicted total concentrations with constant emissions for both SCE&G Wateree Station and IP Eastover Mill

## 9 Conclusion

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The air quality modeling analysis presented in this report demonstrates that the region surrounding SCE&G Wateree Station and IP Eastover Mill in Eastover, South Carolina is in attainment with respect to the 1-hour NAAQS for SO<sub>2</sub>. This analysis was additionally performed using modeled emissions that are expected to be higher than any future actual emissions. Therefore, the area should be classified as “attainment” with respect to the 1-hour NAAQS for SO<sub>2</sub>.

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